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CLEVELAND, AUGUST 15, 1918

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THE IRON TRADE REVIEW

Vol. LXIII Cleveland, August 15, 1918 *No. 7*

Government Backs Production

Accepts More Direct Responsibility For Supplying Mills and Furnaces With Coal, Labor and Transportation—Fuel Becomes Basic Factor in War Activities—Price Concession to Implement Manufacturers Held up

FINAL responsibility for the maximum performance of war industry is being accepted squarely by the government. While balanced distribution is considered to be the solution of the steel problem, this is based upon the expectation that capacity production of the works shall be maintained. Adequate coal, labor and transportation are seen as the controlling factors. It is realized that the utmost efforts now being made by the steel producers must be fortified to insure their being amply supplied with these essentials at all times. Further extensions of works capacity are looked upon only as complicating the situation and are not being encouraged.

Coal Supply is Problem

Coal is put at the very root of the problem. The rapidly pyramiding demands of war operations both industrial and governmental, greatly exceed the previous working estimates. New by-product and steel works requirements now coming in call for about 1,000,000 tons per annum additional. Increased production and conservation of coal are declared by the fuel administration to be imperative. Restrictions on industrial activities of a nonwar character consequently are destined to be increased. Intimately associated with the necessity of maximum steel and coal output is the increasing application of the rule of priority to labor. Appointment just made of the chairman of the war labor policies board to membership in the priority board is held to be significant.

Hot weather continues to affect iron and steel operations, but not to the extent usually shown in peace times. The coke regions are maintaining their good record. July ingot output was at the annual rate of about 42,800,000 tons, equivalent to about 33,000,000 tons of finished material. This output averaged slightly better than June. The shortage of scrap presents an increasingly serious problem. Blast furnaces by the recommendation of the general committee of the American Iron and Steel institute are not to be shipped wrought iron and steel turnings for 30 days dating from Aug. 19. This is to conserve supplies for the iron mills and open-hearth plants.

Orders More Drastic

Pressure for steel apparently is reaching the point where conciliatory tactics in dealing with plants not producing essentials are being succeeded by more vigorous action. This is well illustrated by the virtually preemptory order of the war industries board to the builders of pleasure automobiles to change over their operations to a war basis by Jan. 1, 1919. It is pointed out that in no other way can these plants be sure of a continuation of their industry and the preservation of their organizations. The steel director in a new communication to the jobbing trade gives an official opinion on various questions which have not been clear.

Price Grant Held Up

After having been agreed to by some of the more influential producers, the $5 per ton concession on steel to the implement manufacturers has been held in abeyance. Protests against what is termed plain discrimination from the rank and file of consumers have had their effect. Whether these will be successful in preventing the special allowance remains a question. The mills apparently have been sharply divided over the advisability of the reduction. Some of the largest producers have been ranked among its advocates. The $5 reduction it is understood is intended to be a waiver of the freight rate of $5.40 from Pittsburgh to Chicago which was added to the price when Pittsburgh was made the sole basing point on plates, shapes and bars effective July 1.

Allocations of pig iron during the past week have touched a new high mark, 166,000 tons. This includes 85,000 tons remaining of the 180,000 tons for Great Britain and 15,000 tons of bessemer for France. Orders distributed by government agency since May exceed 700,000 tons.

AUGUST 15, 1918

THE IRON TRADE REVIEW

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"Force Without Stint"

DEFINITE warning to all nonwar industry is sounded in the message of the war industries board to the manufacturers of pleasure automobiles. A few days ago these manufacturers held a meeting at which they agreed to curtail the production of pleasure cars 50 per cent the coming year, communicating this decision to the war industries board. But the board replied "fairness to your industry compels us to state frankly that the situation as it is presented to us today indicates very clearly that there will be little, if any, of the principal materials required in the manufacture of passenger cars available for nonwar industries after war requirements have been provided for. * * * We strongly believe it is to the best interest of your members and other manufacturers of passenger automobiles to undertake to get on 100 per cent war work as rapidly as possible, not later than Jan. 1, 1919, for in no other way can you be sure of the continuance of your industry and the preservation of your organization." The board has asked for an inventory of all stocks of material on hand and it is understood it intends to commandeer any apparent surplus for more essential requirements in the production of war materials. The handwriting on the wall was to be seen some time since. Now there remains not the least vestige of doubt. The government has adopted to the highest possible degree the policy of "force without stint". Nothing counts excepting the vigorous prosecution of the war. The position of industry after the war and the condition of our foreign trade relations after peace returns are secondary considerations. While no one will dispute the desirability of entering the after-the-war period with intact commercial organizations, it must be recognized that when the efforts toward this end interfere with the application of "force without stint" in the slightest iota, then such efforts are baneful. Unless we win this war, any commercial preparation that might be made would be fruitless. And so, in putting aside every extraneous aim to concentrate the greatest measure of force in the war, we are, in reality, making the greatest preparation for our after-the-war trade.

Scrap Saving a Patriotic Duty

SHORTAGE of steel scrap in the United States is one of the problems the steel industry has had presented forcibly in recent weeks. Unlike other shortages that may come about, this is difficult to remedy because there is no absolute source from which it is obtained and it is not a manufactured product. It is an accident of manufacturing, replacement or wear and its production depends entirely on activities which have been much disturbed in recent months.

Railroads are not replacing rails to the usual extent, nor are they discarding usable material as freely as formerly, shutting the sluice gates on much that formerly was available. Heavy demand for months back has drained accumulations in the hands of country dealers until little is available there.

Thousands, even millions of tons of metal products have been shipped to the European battle front, where they are lost to the United States and give no opportunity for reclamation and use here.

To overcome the lack of scrap many steel makers have changed their practice and are using more pig iron in the open hearth, replacing scrap by new iron. This is a drain on the stock of ore and while that will solve the problem temporarily the shortage must be made good later, unless more scrap is made available in time.

It is being made a patriotic duty to save and place in market channels all metal scrap wherever located in order to satisfy the acute general need.

Accuracy in Foundry Work

THE government's plans for engaging the capacity of the gray-iron foundries of the country through the purchase of a large number of semisteel shells and other castings are maturing. This work is destined to have a tremendous influence on American foundry practice. At the outset difficulties undoubtedly will be met in fulfilling the neces-

sarily rigid specifications for this work. In the long run, however, the industry will be the gainer through the ability that will be acquired generally to make castings with greater precision. This ability will in time prove a great asset to American foundrymen. In the past our foundrymen have devoted most of their energies to the development of speedy and economical methods of production and relatively less attention has been paid to exact workmanship. In fact, the ever-present clamor for tonnage led some foreign observers so far astray that the opinion became rather general in certain parts of Europe that Americans were temperamentally unfitted to work to exacting limits or to turn out articles in the manufacture of which accuracy is of prime importance.

Careful observers, however, have always been keenly aware of the fact that Americans are just as capable when it comes to work requiring great accuracy as any other nation. For obvious reasons this skill has perhaps shone less conspicuously in the foundry industry than in some other trades, but even in the manufacture of castings there has been plenty of evidence of ability to do precise work. The leaven of accuracy, however, has not spread sufficiently through the foundry industry, and it is for this reason that thoughtful students of the future welfare of the casting business welcome the government's plan for the purchase of a large number of semisteel shells and other castings.

The following incident throws a light on the degree of precision demanded in this work. A certain foundry in the Middle West took a contract for making semisteel trench-mortar bombs. It was decided to make most of the mold in the drag on a stripping-plate machine. Great difficulty was experienced in securing a clean draw. Finally the cylindrical portion of the pattern was carefully measured with micrometer calipers and found to be a few ten-thousandths of an inch too large at one point. The pattern was removed and dressed down to a uniform diameter. We venture the assertion that to many foundrymen the introduction of micrometer calipers into their operations would be an unusual novelty. The habit of accuracy we are now learning will be a great asset to us in the days to come when American industry must compete with those of other lands in the open markets of the world.

Women as Substitutes for Men

EACH new call for men for the army brings forth renewed interest in the question of woman's suitability to fill the places left vacant in the workshop. Each investigation of the subject so far has led to the same conclusion—that woman is quite capable of stepping in and filling up the empty benches. The national industrial conference board recently investigated the matter of woman's efficiency in the metal trades and its report is decidedly favorable. Women not only can, but are, entering the shops. They are doing work previously done by men and in many cases are doing it better than it was done prior to their advent into the field. Some work is still beyond them as they lack the preliminary training necessary to its accomplishment. Whether or not women can be made into skilled mechanics is yet to be discovered, but reports from England would seem to indicate that employers there think them capable of handling the more difficult work.

So far it has not been hard to find women to go into the shops. They have willingly left other work to enter the new field. Reasons for their eagerness to change are easy to find. Higher wages attract them from some occupations and the definiteness of the hours lures them from others. Up to the present, most of the women entering the factories and shops are women who have worked at other occupations at various time. If the war continues for any length of time, however, recruits will have to be found among those who have hitherto stayed in the home. With the regular wage earners gone to war, there is small doubt but that many of these will be eager to obtain such work.

The Day for the Repair Man

THE present situation in the automobile industry suggests that the immediate future holds a brighter outlook for repair men than it does for some manufacturers. The production of pleasure vehicles is diminishing and new utility cars diverted to war purposes, which means that those possessing automobiles and trucks will be compelled to obtain longer use from them than would be the case if the market was normal. Old, worn-out cars, which ordinarily would be "junked", must be made serviceable, and the car-a-year plan must be abandoned, temporarily at least, for the exigency of the occasion makes replacement on a full scale impossible.

What will be the natural consequence of a situation of this kind? Garage men, who have plants properly equipped and men competent to do the work may be expected to reap rich rewards. Far-sighted individuals to whom the prospect looms encouragingly might be tempted to establish garages; indeed, we might expect to have an over-abundant crop were it not for the fact that machinery necessary to establish shops for the repair of automobiles is difficult to obtain while it also is a problem to obtain skilled mechanics. Nevertheless, the opportunity is there.

A similar situation obtains in many other lines of endeavor. As the price of leather goes up we may expect to see more repair work done. It extends all the way down the line—the repair man is going to be a more important factor in this situation than we have given him credit for. It is a natural result of the growing demand for economizing.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 416

PIG IRON

Bessemer, valley	$35.20
Bessemer, Pittsburgh	$36.60
Basic, Pittsburgh	33.40
Basic, eastern Pa.	32.00
Basic, Buffalo	32.00
Malleable, Pittsburgh	34.90
Malleable, Chicago	33.50
Malleable, Buffalo	33.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern), $33 furnace base.

2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern), base plus 50c.

2.75 to 3.25 silicon (No. 1X, No. 2, soft), base plus $1.50.

Over 3.25 silicon, $34.50, plus $1.00 for each ½ per cent of silicon.

No. 1X, Phila.	35.25 to 35.50
No. 2 foundry, Pittsburgh	34.40
No. 2 foundry, Cleveland	33.00
No. 2 foundry, Ironton	33.00
No. 1 foundry, Chicago	33.50
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.25 to 34.50
No. 2X foundry, N. J. tide	34.25 to 34.50
No. 2X foundry, Buffalo	33.50
No. 2 plain, Philadelphia	33.75 to 34.00
No. 2 plain, N. J. tide	33.75 to 34.00
No. 2 southern Birmingham	33.00 to 33.50
No. 2 southern, Cincinnati	37.10
No. 2 southern, Chicago	38.50
No. 2 southern, Phila.	40.10
No. 2 southern, Cleveland	38.50
No. 2 southern, Boston	41.00
No. 2 southern, St. Louis	39.75
Virginia, No. 2X, furnace	33.50
Virginia, No. 2X, Phila.	37.60
Virginia, No. 2X, Jersey City	37.90
Virginia, No. 2X, Boston	38.20
Gray forge, Pittsburgh	33.40
Silveries, 8 per cent, furnace	45.50
Silveries, 8 per cent, Chicago	48.50
Low phos. standard, Phila.	56.00
Low phos. Lebanon, furnace	50.00 to 52.00
Low phos., Pittsburgh standard	54.40
Charcoal, Superior, Chicago	37.70 to 38.00
Charcoal, Superior, Buffalo	37.50
Charcoal, southern to 2 per cent silicon	50.00

COKE

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

FERROALLOYS

Ferromanganese, 70 per cent delivered	250.00
Spiegel, 16 per cent fur., spot.	75.00
Spiegel, contracts, furnace.	75.00
Ferrocarbon titanium, carloads, maker's plant	200.00
Ferrosilicon, 50 per cent, third quarter, Pitts.	155.00 to 165.00
Ferrosilicon, 50 per cent, Pitts., remainder of 1918	155.00 to 165.00
Bessemer ferrosilicon, 10 per cent.	55.00
Bessemer ferrosilicon, 11 per cent.	58.30
Bessemer ferrosilicon, 12 per cent.	61.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

SEMIFINISHED MATERIAL

BILLETS AND BLOOMS

Open-hearth, Pittsburgh	$47.50
Open-hearth, Philadelphia	51.30
Open-hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forging, Pittsburgh	60.00
Forging, Philadelphia	63.80

SHEET BARS

Open-hearth, Pittsburgh	$51.00
Open-hearth, Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

SLABS

Pittsburgh and Youngstown.	$50.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pittsburgh	2.90c
Sheared skelp, Pittsburgh	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.23c
Structural shapes, N. Y.	3.245c
Structural shapes, Chgo.	3.27c
Tank plates, Chicago	3.52c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.48c
Tank plates, New York	3.495c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	3.17c
Bars, soft steel, New York	3.145c
Bars, soft steel, Phila.	3.13c
Bar iron, Phila.	3.73c
Bar iron, Chicago	3.50c
Bar iron, Cleveland	3.67c
Bar iron, New York	3.745c
Bar iron, Pittsburgh	3.50c
Hard steel bars ,Chicago	3.00c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base.	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open-hearth rails, mill	$7.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, light, St. L.	60.00 to 67.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	5.115c
Tie plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh.	3.95
Polished staples, Pittsburgh.	3.65
Galvanized staples, Pbgh.	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	4.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	7.50c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

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SHEETS

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open-hearth, Chi.	5.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open-hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open-hearth, Chi.	6.52c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open-hearth, Chi.	4.52c
No. 10, open-hearth, Phila.	4.48c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
⅜ to 3 in., butt, steel	51	37½
¼ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	30
Iron, 3½ to 4½ inches, c. l.	12½

CAST IRON WATER PIPE

Without War Freight Tax

(Class B Pipe)

Class A pipe is $1 higher than Class B.

Four-inch, Chicago	64.80
Six-inch and over, Chicago	61.80
Four-inch, New York	65.70
Six-inch and over, N. Y.	62.70
Four-inch, Birmingham	58.00
Six-in. and over, Birmingham	$5.00

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	3.50c
Hot rolled strip steel, Pitts.	3.50c
Hot rolled strip steel, Pitts. stamping quality	4.00c
Shafting, Pitts., carloads	17 off to list
Cotton ties, Aug., per bundle	$1.94

RIVETS

Structural rivets, Pittsburgh.	4.40c
Boiler rivets, Pittsburgh	4.50c
Rivets ⅞ in. & small., Pitts.	50 and 10 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50–5 off
Cut thread	40–10–5 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50–10–5 off
Cut thread	50–5 off
Larger and longer	40–10 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	60–10–10 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	70–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Quotation on leading products August 14, average for July, 1918, average for May ,1918, and average for August, 1917. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Aug. 14, 1918	Average prices July, 1918	May, 1918	Aug., 1917
Bessemer pig iron, Pittsburgh..	$36.60	$36.60	$36.15	$55.55
Basic pig iron, Pittsburgh.....	33.40	33.40	32.95	52.75
*No. 2 Foundry pig iron, Pitts.	34.40	34.40	33.95	55.55
*No. 2, Foundry pig iron, Chi.	33.00	33.00	33.00	55.00
Lake Superior charcoal, Chicago	37.70	37.70	37.50	59.50
Malleable, valley	33.50	34.90	34.45	55.55
Malleable, Chicago	33.50	33.50	33.50	55.00
**Southern, No. 2, Birmingham.	33.50	33.50	33.50	48.00
*Southern Ohio No. 2, Ironton	33.00	33.00	33.00	55.00
Basic, eastern Pa.....	32.00	32.00	32.00	51.00
**No. 2X Virginia, furnace....	33.50	33.50	33.50	51.90
**No. 2X foundry, Philadelphia	34.50	34.50	34.25	53.40
Ferromanganese, 70%, delivered	250.00	250.00	250.00	375.00
Bessemer billets, Pittsburgh....	47.50	47.50	47.50	93.00
Bessemer sheet bars, Pittsburgh	51.00	51.00	51.00	96.00
Open-hearth sheet bars, Pitts..	51.00	51.00	51.00	96.00
Open-hearth billets, Pitts.....	47.50	47.50	47.50	93.00
Steel bars, Pittsburgh.....	2.90	2.90	2.90	4.00
Steel bars, Chicago.....	3.17	3.17	2.90	4.50
Iron bars, Philadelphia.....	3.73	3.73	3.50	4.92

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Prices Aug. 14, 1918	Average prices July, 1918	May, 1918	Aug., 1917
Iron bars, Cleveland.....	$3.64	3.64	3.64	4.75
Iron bars, Chicago mill.....	3.50	3.50	3.50	4.50
Beams, Chicago	3.27	3.27	3.00	5.88
Beams, Pittsburgh	3.00	3.00	3.00	4.50
Beams, Philadelphia	3.23	3.23	3.18	4.92
Tank plates, Pittsburgh.....	3.25	3.25	3.25	8.80
Tank plates, Chicago.....	3.52	3.52	3.25	9 64
Tank plates, Philadelphia.....	3.48	3.48	3.43	10.17
Sheets, blk., No. 28, Pitts.....	5.00	5.00	5.00	9.00
Sheets, blue anld., No. 10, Pitts.	4.25	4.25	4.25	8.50
Sheets, galv., No. 28, Pitts....	6.25	6.25	6.25	10.25
Wire nails, Pittsburgh.....	3.50	3.50	3.50	4.00
Connellsville furnace coke.....	6.00	6.00	6.00	10.00
Connellsville foundry coke.....	7.00	7.00	7.00	12.70
Heavy melting steel, Pitts.....	29.00	29.00	29.00	34.60
Heavy melting steel, eastern Pa.	28.50	28.50	28.50	32.80
Heavy melting steel, Chicago..	29.00	29.00	28.90	35.50
No. 1 wrought, eastern Pa....	34.00	34.00	34.00	46.24
No. 1 wrought, Chicago.....	33.50	33.50	33.50	49.28
Rerolling rails, Chicago.....	34.00	34.00	34.00	46.25

(For Additional Prices See Page 416)

War Orders For Iron Total Large

Government Allocates 166,000 Tons in Week—Remaining 85,000 Tons of British Basic Order Placed—Pittsburgh Buyer Wants 20,000 Tons of Basic—More 1919 Selling—Heat Reduces Production

Cleveland, Aug. 13.—A record breaking tonnage of iron was allocated during the past week by the committee on pig iron, iron ore and lake transportation and this amounted to 166,000 tons. This brings the total amount distributed for government account since May 1 to 713,000 tons. The week's orders were contributed to heavily by basic of which 99,000 tons were placed. This embraced the formal allotment of the remaining portion of the British order or 85,000 tons including 35,000 tons additional to a Cleveland steel works interest and 50,000 tons to Alabama producers. A lot of 14,000 tons of basic also was placed in behalf of a central Ohio steelmaker. Bessemer allocations totaled 23,000 tons of which 15,000 tons were for France. The week's totals in other grades were 25,000 tons of foundry, 9000 tons of malleable and 7000 tons of low phosphorus. Heavy requests for iron cotninue to be made upon the committee. Foundry iron is figuring more heavily in these matters. The war industries board and the steel director, effective Sept. 1 will modify the present system of receiving weekly reports from producers on unfilled orders, shipments, etc. Under the new plan these reports will be submitted monthly and will be made on a new and amplified form now being prepared. The latter will be more comprehensive than the one now in use and will include data which will be helpful to the pig iron committee. Some selling of iron for 1919 delivery subject to the usual restrictions continues to be done in this district. Foundrymen in this territory are more aroused over the uncertainty of future supplies because of the changing over to basic of local furnaces which have been supplying them. It is claimed essential contracts will be held up. A delegation of foundrymen may lay the matter before the Washington authorities and either ask for a modification of the plan of switching foundry production to basic or that their supplies be allocated for them. One of the Cleveland Furnace Co. stacks will resume this week.

Foundries Are Short

Boston, Aug. 12.—The liberal conditions prevailing among foundrymen regarding coke deliveries are not duplicated regarding iron. The foundries are much shorter on iron than on coke. Most everyone is glad to get iron, for there has been no time in two years when many foundrymen had an oversupply. The pig iron dealers are pleased with the ruling at Washington, which puts delivery up to the maker, instead of obliging the issuance of priorities. Local dealers think that this plan will work out most satisfactorily and that it is the only sensible way to handle the business. There is little change in iron market conditions.

Bethlehem Tonnage Placed

New York, Aug. 12.—Allocations of several thousand tons of foundry grades again constituted most of the business in the pig iron market in this district during the past week. Included in recent allocations were approximately 16,000 tons of foundry for the Bethlehem Steel Co., which interest will ship the iron on its foundry contracts. Most of the latter iron, it is understood, is to be fur-

nished from the south. Another allocation of interest was 15,000 tons of bessemer for shipment to France. Only occasional selling for 1919 delivery is being encountered in the territory and then it is strictly limited to war necessities and delivery is made subject to government requirements.

1919 Foundry Iron Sold

Philadelphia, Aug. 13.—Selling of foundry iron for delivery over the first half of 1919 has been the principal development in the market in this district in the past week. Only a few eastern Pennsylvania furnaces have participated. The business is fairly heavy, however, and embraces a considerable tonnage. Sales are being made only to regular customers. The allocations of the week included many small lots of foundry iron totaling several thousand tons and also a few moderate tonnages of low phosphorus iron. Alabama furnaces are to supply the 16,000 tons of foundry iron which the Bethlehem Steel Co. requires to meet its unfilled contracts. Recommendations have been made for the allocation of several thousand tons more of low phosphorus.

Humidity Cuts Production

Pittsburgh, Aug. 14.—Excessive humidity which has been prevailing since the first of the present month, has caused considerable curtailment in the production of pig iron, some of the larger furnaces losing from 30 to 40 tons a day. Owing to this condition, output for this district in August probably will show a rather sharp decline. In view of the scarcity of steelmaking and foundry iron, the situation is an unusually unfortunate one. Few furnaces also are suffering slightly from a shortage of coke which means a still further curtailment of tonnages. Inquiries for first half delivery continue to come to blast furnace interests in good sized volume but so far as can be learned, no additional contracts for that delivery are being made. Tonnages are going only to essential consumers and all indications point to the probability that those who have not been able to cover for the first half will have to depend upon the war industries board to allocate the iron for them, as is being done extensively at present. The board apparently desires to maintain this system of distribution and has discouraged the idea of contracting for next year. A consumer in this district, engaged in making semifinished steel which enters into essential manufacture, has put out an inquiry for 20,000 tons of basic iron for first half delivery, and another user of foundry iron, also in this district, is trying to cover its requirements for that period. Numerous other inquiries are out, one of them for from 2000 to 3000 tons of bessemer iron for the shipment mentioned.

Inquiry Still Heavy

Buffalo, Aug. 13.—A certain amount of foundry iron has been allocated to local furnaces the past week by the government. Inquiry rolls in, but there is no quoting. This inquiry comes from outside districts including Ohio and the south, but it is not resulting in any contracting. Apparently all the 1919 business has been done that will be done in this district for some time. Furnacemen are forwarding reports weekly to the war industries board. Every order shipped on is reported and classified as to government, domestic or foreign tonnage. It is likewise classified as to its being in one of the four preferred classes.

Shortage Retards Mills

Youngstown, O., Aug. 14.—A pig-iron shortage has affected nearly all Mahoning and Shenango valley works and as a result the average production of bessemer plants has fallen to 77 per cent. The shortage is making itself felt in many of the finishing mills also. One maker here who is obliged to furnish sheet bars to nearby sheetmakers is short on bessemer steel and consequently is compelled to keep a finishing mill idle in order to supply the bars allocated to him. Last week two finishing mills were down on this account.

Limit 1919 Contracts

Chicago, Aug. 13.—Lines are being drawn more closely on contracts for pig iron for delivery during first half of 1919. Until the government clears the situation decidedly, northern makers are unwilling to take further contracts for that delivery except in the few instances where regular customers are absolutely known to have government business requiring iron through that period. This has the effect of almost stopping making of contracts and until the situation is decidedly clearer, it will not be resumed. Every effort of makers now is centered on proper distribution. This is being done successfully and no protests are being made by the government or by melters having proper excuses for receiving supplies. Some tonnages are being given local producers for immediate delivery, taking precedence over contracts on books, which is having the effect of delaying contract shipments somewhat. However, general deliveries are being kept up better than would be expected and the situation is not difficult. Southern furnaces are considerably behind on deliveries, a number of larger producers being 30,000 to 50,000 back on first half contracts. Poor operation is responsible for part of this and allocations of basic iron for export has also interfered. In some cases basic has been allotted to furnaces not usually making this grade and much difficulty is experienced in producing it. A liberal specification is given, allowing silicon 1.25 or less and sand-cast iron is accepted.

Production Is Watched

Cincinnati, Aug. 12.—The production of iron is an all absorbing topic. It was thought that the hot weather would shut down a number of furnaces but reports from southern Ohio are that workmen are sticking to their jobs and there has been only a short curtailment in the output of iron. Reports from the south are also encouraging, but coke oven workmen are not quite as faithful and it is feared that a shortage of this fuel may result in some embarrassment to iron furnace operators should the present weather last very long. Practically no contracting for next year is under way. In a few instances some sales have been made to favored customers, but until Sept. 1 has been passed there will likely be little buying. No rumors have been set afloat of any changes expected that would affect the last quarter or first half and it is believed that present prices will be allowed to stand. Makers of both basic and malleable are receiving instructions almost daily to distribute shipments to melters who are engaged in urgent essential work.

Southern Supply Fails

St. Louis, Aug. 12.—As far as this district is concerned, the southern pig iron is rapidly working into the same class as eastern and northern districts. The latter have been able to offer nothing in a number of weeks, and now the small southern surplusses are about exhausted, and customers of the principal furnaces in the south are being told that the latter are at the end of their resources and can furnish no iron of any grade unless it is for preferential war work. This removes the last peg upon which nonwar manufacturers had hung their hopes. Selling agencies of leading Birmingham producers report that many of their oldest and best customers are being turned down, while they are being compelled, under government alloca-

tion, to ship to consumers with whom they have never had trade relations heretofore. Consensus of best opinion here is that there will be no surplus pig iron this year, and should the war continue none in 1919 either. Stovemakers in this district have joined the movement of protest against being deprived of raw material.

Little Selling for 1919

Birmingham, Ala., Aug. 13.—Inquiries for pig iron for delivery during the first half of 1919 still are being received by southern furnaces but there is but little selling. There is more or less uncertainty as to the tonnage the government will need next year and until it is clear that orders accepted can be guaranteed, no active effort is being made to book business. Several companies in this district announce positively that they are out of the market for 1919 iron although one or two of them intimate that some sales have been made. Production in Alabama still is below expectations. Raw material supplies are not as easy as they might be. Labor is a little uncertain, too. Railroad car shortage is causing some deflection in the shipment of iron The basic iron being produced in this district on the British order is being piled until such time as ships are being provided at some port.

Mills Well Sold Up

Pittsburgh, Aug. 13.—The mills are booked on cotton ties up to Nov. 1. There is little of interest in this branch of the industry, except that deliveries on existing contracts are not especially free, for like a good many other lines, production has been, and still is, curtailed by the scarcity of steel. This year's cotton crop has suffered a material shrinkage during the past month or so as a result of the unfavorable weather conditions, but it still promises to be well in excess of the 1917 yield. The August price for ties is $1.94 per bundle of 45.

Classify Old Orders

Buffalo, Aug. 13.—Plate, bar and finished steel sales offices report that compliance with the new ruling of the war industries board, establishing automatic priority classifications upon receipt of signed affidavits is taking practically all their time in getting old orders properly adjusted. No new business is being taken except strictly government orders.

Coke Ovens Hold Up Well

Employes Remain Steadfastly at Work Despite Heat—Supplies Directed to Furnaces—Frick Shuts Down Beehive Plants

Pittsburgh, Aug. 14.—Production of coke at hand drawn ovens in the Connellsville region has been curtailed on account of the extremely hot weather. There is a further decline in that district owing to the fact that the Frick Coke Co. is putting out its ovens; that producer having shut down 2863 in one week recently. This, however, does not mean a decrease in the output of coke inasmuch as the Frick company is diverting its coal from the Connellsville ovens to the by-product plants of Steel Corporation subsidiaries, among them being the new ovens of the Carnegie Steel Co. at Clairton, Pa. On the whole production in the Connellsville region is being maintained exceptionally well due to the fact that employes are remaining more steadfastly at their work than usual. Some furnaces during the past week were short of coke and as a result the fuel administration diverted large tonnages which were to apply on contracts that producers had with other consumers. There are practically no offerings of furnace coke and when any surplus tonnages do become available, they are allocated by the fuel administration, but it is somewhat easier to get foundry tonnages, due to the higher price which this grade commands. Production in the Connellsville region for the week ending Aug. 3 totaled 340,980 tons as compared with 352,625 tons for the preceding week, according to the *Connellsville Courier*.

Connellsville Makers Withdraw

New York, Aug. 12.—Connellsville coke makers who recently came into the market to sell coke for the first half of 1919 have withdrawn. Some of these producers remained sellers only long enough to give their regular customers a chance to renew their contracts. Business in coke is at a minimum. Some New Jersey and New England by-product continues to be sold but not actively, as most of the consumers in this territory have closed for their forward requirements.

More Tonnage Than Needed

Boston, Aug. 12.—More coke is being manufactured than the New England market can absorb. This situation was brought about by the embargo, which keeps local coke this side of the east bank of the Hudson river and Pennsylvania coke no nearer New England than the west bank of that river. There is a steadily increasing tendency among the New England foundry men to hold up shipments, despite the letters that the coke brokers have sent out advising them against such a policy. Fully 25 per cent of the foundries are asking for delayed shipments. This is regarded as a most dangerous policy. The coke manufacturers cannot store their product and if they cannot deliver it day by day they may be forced to seek other markets. The leading New England coke producer is not creating a reserve but is anticipating shipments on contracts dating from Jan. 1. That is a very unusual situation.

Output Surprisingly Good

Cincinnati, Aug. 12.—No news has been distributed that would be more welcomed than that the oven operators have been able to keep up production during the extreme weather that now prevails. Some complaint has been made but the general average of production is somewhat surprising. It is true that charges are not drawn on time and that 72-hour coke is made where the 48-hour product is intended to be produced. Very little contracting for next year is reported. The only matter of concern now is the growing anxiety of consumers to obtain a future supply.

Shipments Fall Slightly

St. Louis, Aug. 12.—About the only change in the coke situation during the past week has been a slight slowing down in shipments from eastern ovens. The early days of August have proved disappointing as contrasted with July, which was by far the best month in two years in the matter of delivery efficiency.

Production Doing Well

Birmingham, Ala., Aug. 13.—Everything considered, coke production in southern territory is holding up well. The coal production in Alabama is off a little, occasioned by a railroad car shortage. Judge H. C. Selheimer, arbiter in this district between operators and employes at coal mines, has been appointed production manager in Alabama, in addition to the other duties, and he is giving attention to a full operation of mines. The New Castle Coal Co. announces the shipment of 1590 tons of coke to Valparaiso and is now filling a small contract for shipment to American smelting interests in Mexico.

Fear Rising Over Scrap

Shortage of Leading Grades is Constantly Growing Problem—Railroads Stripped of Accumulations—Institute Committee Acts

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Pittsburgh, Aug. 13.—Shortage of the leading grades of scrap has become more marked and is the cause of serious concern on the part of consumers. Large tonnages could be sold if they were available, but dealers have no offerings to make on new business but are making fairly good sized shipments on contracts. Heavy melting steel, guaranteed low phosphorus scrap and heavy shell turnings are in especially strong demand. A consumers in this district is reported to have taken a sizeable tonnage of stove plate at $29 delivered, plus the commission of 3½ per cent. The market on this grade appears to be quotable at $26.50 to $27 delivered, dealer's buying price. Even tonnages of this grade which ordinarily are available ,are reported to be scarce. Under advices of the government, central Pennsylvania is being scoured for scrap material. Railroads are co-operating in the search and will aid in the movement by having cars on hand for prompt shipment. It is reported that good sized tonnages have been found in this way but have not been sufficient to be an important market factor.

Chicago Famine Continues

Chicago, Aug. 13.—Shortage of iron and steel scrap, especially in material for open hearth use, continues to be the important factor in the Chicago market. Dealers are unable to find sufficient tonnage to fill orders taken some time ago and most consumers have standing orders for all the material possible to furnish them. Practically nothing is being shipped east at present although some tonnages were sent out on permits which have not been completely filled. Cast scrap is in greater demand and the supply is small. Rerolling rails are practically unobtainable and such tonnages as appear infrequently are placed immediately, but are not sufficient to cover the demand. Railroad offerings are small. The Wabash offers 900 tons, the Union Pacific 260 tons and the Michigan Central has a list out on which tonnages are not mentioned.

Crowder Ruling Pleases

Boston, Aug. 12.—Scrap men are happy over a recent ruling from Provost Marshal Crowder that their industry does not come under the "work or fight order." Fully two-thirds of the laborers in the local yards would be subject to the proposed new draft ages, but as their work is regarded as essential they will not be disturbed. It is most difficult to secure help. Neither young nor old men look upon handling all kinds of metal as attractive in normal times and now that there are so many lucrative positions in other lines the scrap yards suffer as never before. Good wages are being paid, however, and conditions are made as easy as possible. Scrap is not moving briskly, but as regularly and in as good volume as is necessary to meet requirements with so much inefficient help.

Supplies Continue Low

New York, Aug. 13.—While supplies of cast and steel scrap are coming out in fair volume, the continued good demand is keeping supplies very low; in fact, the various grades of scrap generally are scarce. Perhaps the material most plentiful at this time is low phosphorus scrap, for which there is only a fair demand. Prices remain firm at the levels fixed by the government. With the return of somewhat cooler weather, operations at the yards are improved, although not near normal due to the extreme shortage of experienced labor.

Demand Remains Strong

Buffalo, Aug. 13.—The demand is steady for all grades of scrap. The inquiry is for everything a dealer has. Big sales are few and far between as most dealers fear to go short for even a brief period on heavy melting steel; consequently they keep the yards very bare. Cast scrap is in very strong demand just now along with every heavy grade. There have been strong inquiries from Pittsburgh and Youngstown consumers for machine shop turnings who claim permits will be available, as there is no market here for the ordinary shop turnings. Purchases of first cut shell turnings have been made here by open-hearth plants and it is reported that in some instances shoveling machine shop turnings are being applied on these orders. The car shortage is more pronounced.

Small Sales Prevail

Cleveland, Aug. 13.—Dealers as a rule are not selling any scrap until certain of their source of supplies. As a result, considerable scrap is changing hands, but in small lots. Heavy melting steel, along with turnings and borings, is the most active, demand being considerably in excess of supply. Prices continue at the maximum, or virtually at that point. Shell turnings are coming into the market in much smaller quantities than dealers had estimated. Dealers' yards are well stocked with mixed material. Some traders reason that the scarcity of scrap iron and steel this winter will not be as acute as predicted as they believe demand will be lightened somewhat by the record tonnage of Lake Superior iron ore being brought down.

Railroad Supplies Stripped

St. Louis, Aug. 12.—Light stocks, a marked paucity of offerings and a good general demand are the outstanding factors in the scrap iron and steel market here. Consumers are clamoring for supplies, and in addition there are endless inquiries from other points for all grades, mainly steel. Yard stocks are abnormally low for this season, and important melters have little material on hand. One exception is the National Enameling & Stamping Co., but the fact that it has a sizable pile is attributable to its recent suspension, due to labor entanglements. From what can be gathered the railroads have about furnished all they have to offer toward the general supply. Under orders from the regional high command, division officials have raked their several fields, and the same is true of the heads of great railroad shops. During the past two weeks the only offerings have been 1100 tons by the Wabash, 325 by the Mobile & Ohio and 600 tons by the Union Pacific. Locally there is no market established for shell turnings, for the reason that consumers have refused to pay the government maximum plus commission. Machine shop turnings range from $18.50 to $19, and $24 is the quotation on heavy shell turnings.

Market Drags in South

Birmingham, Ala., Aug. 13.—Southern dealers in old material assert that the market is dragging along. Local consumers are not willing to pay the government prices and the holders of scrap are asking almost that price. Old contracts are being filled

and the yards are being replenished only when the scrap can be bought at a low price. So far no business has been attracted to this district from the larger centers and there is some doubt if cars could be readily had in case some of this business should develop. The local users of heavy melting steel have established an offering price around $26.50, delivered.

Criticise New Recommendation

Philadelphia, Aug. 13.—Some criticism is being heard among scrap dealers of the recommendations of the general iron and steel committee of the American Iron and Steel institute barring shipments of wrought iron and steel turnings to blast furnaces except makers of low phosphorus iron for the 30 days beginning Aug. 19. They say that the desired results could have been obtained by fixing a price on turnings higher to the open hearth mills than to the blast furnaces. Creation of such a differential they contend would prevent the blast furnaces from obtaining turnings. All grades of scrap are in active demand and scarce. Stove plate now is bringing a maximum of $29 delivered.

Heat Effects

Small In Sheet Mills But Steel Shortage Curbs Output

Pittsburgh, Aug. 14.—Operations of sheet mills gradually are growing less, due principally to the shortage of sheet bars. Despite the intensity of the weather, it has not affected production, there being more labor than there is steel. In a general way there appears to be business for 30 to 45 days on the books of mills taking the same classification as Class A priority orders, and perhaps an additional 30 to 45 days taking a Class B rating. The volume of government business involves good sized and miscellaneous tonnages and is coming out faster than shipments are being made. This shows plainly that it has become more difficult to distribute sheets for essential needs. No signs are in evidence that there will be an increased production of sheet bars or that greater tonnages can be supplied to sheet mills. On the contrary, shipments may be deferred further and the sheet bar supply decreased. Operations of sheet mills continue to approach a more nearly uniform basis which has been brought about as a result of the system of allocating sheet bars.

Orders Are Reclassified

Philadelphia, Aug. 13.—Sheet orders taken recently from jobbers by the leading eastern maker now are being reclassified under the new priority schedule. This interest hopes, if future allocations do not prevent, to complete deliveries on contracts during the next four or five months.

Refuse New Business

Youngstown, O., Aug. 14.—Sheet bars continue to be scarce in the valley and as a result of this condition, sheetmakers have tightened up on new business. A few makers are refusing to take on any new business whatsoever, having more obligations on their books now than what they feel they can properly take care of. Few sheetmakers in this territory who depend on outside mills for their supply of semifinished material, have a reserve stock of bars in their banks. Even self-contained makers find their stock exceedingly low right now due to the steel being diverted into other channels. Sheetmakers who buy their bars are depending solely on the bars in transit for operating their mills and consequently are not promising buyers any sort of delivery. The excessive heat has caused a falling off of production.

Output Is Limited

Chicago, Aug. 13.—Sheet mills in the Chicago district are running about two-thirds capacity, lack of steel and extreme hot weather being the limiting factors. The leading independent is booking orders from jobbers for replacement on the basis of July and August supply being made equal to one-third the tonnage shipped during the first six months of this year. This is regarded as a fairer basis than any other. In some cases jobbers have obtained priorities, and when these certificates call for more than the proportional tonnage mentioned, it is furnished according to the priority certificate. Demand for sheets is fair but not heavy, although a full supply probably would bring out strong buying. The mills are meeting all the demands made of them.

More Tonnage is Demanded

Unsatisfied Steel Requirements Continue to Cause Trouble—50,000 Tons of Shell Material Placed—Target Projectiles Wanted

Pittsburgh, Aug. 13.—Increasing demands by the war industries board for steel, it seems evident, can be met only through the building of additional open hearth and blast furnace capacity. This is being done or has been ordered, but no great expansion probably will be available in time to meet the requirements. The demand for sheet bars and billets continues heavy with no offerings made. The war industries board has placed requirements for 50,000 tons of shell steel that must be turned out in August. The war resources committee of the Pittsburgh chamber of commerce has received specifications for more than 135,000 target shells for the navy. The specifications include 1000 cast iron and semi-steel shells of 16-inch caliber, 10,000 12-inch and 8000 14-inch shells. It is proposed to do considerable target shooting with 6-inch guns as there is a requisition for 50,000 shells of that caliber, and the same number of 5-inch forged steel shells have been asked for. Fair demand also is being made for wire rods but makers are not quoting, although some of them are supplying limited lots to regular customers.

Buy Plate Rejections

Cleveland, Aug. 13.—Some of the sheet mills hard pressed to get rerolling material have been buying accumulations of plate rejections from the producers which are being sheared up to sheet bar size. One lot of 1000 tons of this character was sold in this district this week. Local wire mills continue to ship considerable semifinished steel to other plants in this territory fulfilling war contracts.

Strip Mills Short

Pittsburgh, Aug. 13.—Operations of cold rolled strip steel mills are estimated at 60 per cent of capacity, virtually all of the tonnage being for essential purposes. Makers are carefully scrutinizing specifications coming from jobbers and it is understood that some of them have been unable to make replacements for August based upon the latter's average monthly shipments. Hot rolled strip steel mills are operating at about 70 per cent of capacity. About 90 per cent of their output is for essential purposes.

Furnace About Ready

President W. A. Thomas of the Brier Hill Co., Youngstown, announces that the new blast furnace of the company probably will be completed about Sept. 15 and the new plate mill about Oct. 1.

Protests Check Price Cut

Consumers and Some Mills Oppose No. 5 Grant on Implement Bars and Other Steel—Concession Reconsidered But Expected to Stand

Chicago, Aug. 13.—The principal interest in the steel bar market at present centers about the effort of agricultural implement manufacturers to obtain a reduction of $5 per ton on steel for their use. So far as can be learned this reduction has not been agreed to on the part of the government, but the general belief is that it will be granted. Practically all steel manufacturers oppose this move as there seems to be no good reason for favoring one interest, which probably would have the effect of unsettling the entire price fabric. One argument put forward by the machinery builders is that the largest manufacturer in that line is a producer of steel and is able to keep down prices on implements and make his profit on the steel, which is not the case with manufacturers forced to buy their material. It is understood that in case the concession is made it will be applied on all steel delivered during last half of the present year, the contracts for which have been made some time past.

Export demand for bar iron, involving rounds principally, is increasing, most of it going in lots up to 1000 tons each, to be shipped to the Orient. Mills are booking this but do not know how long the government will allow them to accept and ship abroad. Demand is also increasing for chain iron, but domestic users of bar iron are not active.

Demand is large for hard steel bars rerolled from rails but mills will sell only as much as they can make from rails already on hand. Most makers are not accepting contracts for concrete reinforcing bars. One mill is not rolling anything from rails, using only shell discards and will not take up rail rolling work until fall, when a reserve of rails has been accumulated.

Discrimination Charged

Cleveland, Aug. 13.—Many protests are being heard from consumers in this district and from some of the sellers as well against the $5 reduction from government prices which it has been proposed to grant on steel entering into farming implements dating from July 1. Buyers charge that this is plain discrimination. Some of the sellers who have been opposed to the concession intimate it will be necessary for the government to allocate this steel if the cut is allowed. These protests in this and other districts appear to be having some influence since mill representatives have received instructions from headquarters to defer action on this matter pending further advice. Previously they had been instructed to ascertain the tonnage upon which implement manufacturers in this district would be entitled to the reduction if allowed. It was proposed that the $5 concession be limited exclusively to steel going into farming implements. Some of the implement plants now are producing other lines than farm tools.

Restricted By Steel Shortage

Pittsburgh, Aug. 13.—Production of steel bars is restricted by the shortage of steel and operations fluctuate considerably, depending upon the available supply of material they have to roll from. The output is going largely on direct government work and consumers who are not well up in the preference list are unable to get tonnages. Some mills still have bookings which were taken as far back as 1915, without any certainty that they will be able to meet these obligations. Specifications from the implement trade are somewhat heavier and are being filled. Reports that this trade may be allowed a concession of $5 a ton for steel have not been received favorably by other consumers who are unable to understand why any discrimination should be made to these interests. According to reports, implement manufacturers some time ago advised their customers that it would be necessary to increase the price of farm implements unless they could buy steel more cheaply. Government authorities are understood also to have interceded on behalf of the farmers so that the latter would not have to pay more money for implements, and perhaps to placate agricultural interests which were disappointed because the administration vetoed the bill recently passed by congress providing a price of $2.50 a bushel for wheat.

Shafting Demand Heavy

Pittsburgh, Aug. 13.—Demand for the largest sizes of shafting to enter into essential manufacture is heavy and no tonnages are available for other consumers. Makers are operating at about 70 per cent of capacity. Curtailment being due to the shortage of steel. Restrictions placed upon the manufacture of pleasure automobiles practically has cut off demand from this source.

Hoop Demand Quieter

Pittsburgh, Aug. 13.—Demand for hoops has dwindled to rather limited proportions. Cooperage interests seem to have sufficient supplies for the present. Less activity also is noted in bands.

Fall Behind Schedules

Cleveland, Aug. 13.—Makers of nuts and bolts continue to fall further behind in their schedules as orders are heavy and steel is scarce. Some of the largest producers in this district now are promising no deliveries under 90 days. The quartermaster's department of the army is checking up stocks of nuts and bolts at various departments throughout the country preparatory to placing orders for the 100,000,000 which remains from the large inquiry recently circulated.

Lack Material for Nuts

Chicago, Aug. 13.—Healthy demand exists for bolts and nuts and large orders are being booked by practically all makers. There is some shortage of material for cold pressed nuts, but this has not become sufficiently marked to cause much inconvenience yet.

Pare Tonnages

Of Pipe to Jobbers Because of Full Mills—Foundries Slack

Pittsburgh, Aug. 13.—Makers of iron and steel lapweld and buttweld pipe are replacing stocks of jobbers, but are holding down the tonnages to the minimum that can be accepted. Mills will supply jobbers only in accordance with replenishment regulations of the war industries board. Jobbers are taking as much tonnage as they can get under B-4 priority classification. Owing to heavy commitments of mills in connection with higher classfications, however, stocks of some jobbers will be built up only to a limited extent, if at all. Demand for lapweld iron and steel pipe continues strong and comes from oil country interests and for industrial plants connected with war work. Some makers of steel lapweld pipe are committed ahead for more than 60 weeks, while manufacturers of iron lapweld pipe are making deliveries in three months. Makers of steel buttweld pipe are booked from six to eight months

ahead. Producers of iron buttweld sizes are making deliveries in two months.

Orders Long Delayed

New York, Aug. 13.—The eastern cast iron pipe market presents few new features. The volume of business is being fairly well maintained, and operating conditions at the plants continue unchanged. Buying for industrial housing and cantonment work comprises the bulk of current trading. Indicative of the difficulty had by municipalities in covering on their requirements, is the recent experience of New York City. This city has just succeeded in closing on 400 tons of pipe, which it had inquired for early last May, but due to a request by the government had not placed.

Routine Orders Fair

Chicago, Aug. 13.—Buying of cast iron pipe continues at a low ebb on the part of municipalities and only routine orders of small lots for repairs and industrial use are being received. Much special heavy work is also being taken on for war use as well as for industrial concerns. Crosby, Minn., opens bids Aug. 13 on 350 tons of pipe.

Little Pipe Being Made

Birmingham, Ala., Aug. 13.—With the exception of working on some old contracts or a little tonnage for the government, little is being done at the cast iron pipe plants in this district. However, the conversion at plants has been sufficient to care for considerable essential work and a number of castings orders have been taken on. Equipment is still being put in at some of these works to care for other contracts, too.

Heat Checks Plants

Youngstown, O., Aug. 14.—Production of iron and steel plants and of coke ovens has been slowed down somewhat this week in the Mahoning and Shenango valleys in nearly every case operators reporting the decrease due to the excessive heat. Coke ovens are operating at 97 per cent; open hearths at 92 per cent; blast furnaces at 88 per cent; and bessemer plants at 77 per cent. Only 2100 tons of steel are piled in the yards of the various steel companies on account of existing embargoes on eastern shipments.

The International Highspeed Steel Co., Rockaway, N. J., is erecting a new office building and adding six new steam hammers.

British Tonnage Unplaced

Allotments of 200,000 Tons of Plates Still Awaited—Chicago Mills Receive 50,000 Tons More For Pacific Coast

Philadelphia, Aug. 13.—Orders for 200,000 tons of plates for Great Britain have not yet been allocated to the various mills, it is learned. A large portion of this tonnage is slated to go to the new Worth Steel Co. plant at Claymont, Del. Several eastern mills received large allocations during the week of ship, boiler and locomotive plates. Fabricators and jobbers vainly are attempting to place orders in the east in accordance with the new priority schedule. Eastern mills have so much high priority business on hand that they can not accommodate tonnage taking the jobbers' classification. It is reported that several fabricators now are negotiating to place their plate orders with a small western mill.

Operating at Capacity

Pittsburgh, Aug. 13.—Plate mills are operating at capacity and are engaged altogether on direct and indirect government work. Just at present large shipments for cars are being made and while part of the tonnage is being rolled from bessemer steel, the proportion is not so large as it was at first believed it would be. This appears to be due to the fact that bessemer steel is becoming about as scarce as open hearth. It is estimated that the plate production today is proceeding at the rate of 500,000 tons a month and in order to maintain this output, steel is being diverted from other lines where requirements are less pressing.

Place Much Ship Material

Chicago, Aug. 13.—In the heavy tonnage of finished steel allocated by the government during the past week, the leading interest has been given two lots for Pacific coast shipbuilders, aggregating approximately 50,000 tons. The usual proportion of this tonnage is plates. Western mills rolling plates for export to Japan have practically finished shipment of this lot, which probably is the reason for these heavy allocations for other uses. Material is going forward fairly well for the government's car-building program, as it is possible to use plates for this purpose which would not meet requirements for ships. No allocation of material for the small railroad cars to be used in France has been made and builders are of the opinion the government expects builders to buy their steel without allocation. Mills, however, are requiring certificates before they will accept these orders for delivery ahead of the government's large car requirements.

Lower Output

In Tin Plate Caused By Heat—Supplies Are Ample

Pittsburgh, Aug. 14.—Operations of tin plate mills which have been proceeding at an unusually high rate for this season of the year, finally have been affected as a result of the hot weather, and production during the past week was curtailed, some mills showing a decrease of about 15 per cent in output. Production in July of this year was the largest ever made in the history of the industry for that month and exceeded the output for June which totaled 3,059,000 base boxes. Shipments continue to be for direct government orders and for perishable food containers only. Supplies for these purposes have been ample while there has been a slight restriction for other food purposes. The extremely large acreage planted has extended the canning season longer than usual. While ordinarily shipments from tin plate mills to take care of needs in connection with the crops are about completed at this time of the year, it is likely that they will continue this season for an indefinite period.

Supply Is Ample

Youngstown, O., Aug. 14.—Rumors to the effect that a 30 per cent tinplate shortage exists in this country is denied by makers in this territory. They say enough tin plate is being made by the mills in this country to take care of present demand and that there is no cause for alarm. It is stated that by Sept. 1 the country's needs will be satisfied. Enough pig tin is on hand to run the mills over the balance of the year and at that time it is expected the price of pig tin will be fixed and conditions such that consumers will have no trouble purchasing their supply for 1919.

The government has purchased a large tract at New Brunswick, N. J., and on it will erect homes, to be occupied by employes of the Wright-Martin Aircraft Corp., New Brunswick.

Shops Now Buying Shapes

Automatic Priority Rating of Fabricators Clears Way For Mills to Accept Orders—Ordnance Plant Steel Placed

Philadelphia, Aug. 13.—Most of the structural shape mills of the east now are booking orders from the fabricators and jobbers under priority numbers fixed by the latter. The mills not only are able to accept their business under the recent priority circular but priority numbers now may be applied automatically on the books covering deliveries months ahead. One large mill expects to make deliveries on these orders in three to four months. The railroad administration is in the market for five 100-ton coal barges for the Erie canal. It is reported that 1000 of these barges are to be bought. Each requires over 100 pounds of fabricated material. For the government ordnance plant which the Midvale Steel Co. will erect, 3800 tons have been placed with the McClintic-Marshall Co.

Busy On Essential Work

Pittsburgh, Aug. 13.—Fabricators are kept extremely busy on essential work and are altogether out of the market for other requirements. It is reported that the government will soon place additional heavy tonnages. Material now is moving to shipyards faster than it is being consumed since the fabricating capacity has been placed on a well organized basis. By reason of this, shipbuilders are in a position to proceed with the construction of vessels without delay, although at some yards there is reported to be a scarcity of steel. On the other hand it is said that other yards have accumulated steel. Because of the system of checking up of shipments made to yards by manufacturers, it is said it would be impossible for the former to stock any surplus steel.

Fabricators Place Orders

New York, Aug. 12.—Fabricators have been given the B 4 classification for the replacement of stocks as a result of the pledges under which they placed themselves last week to accept nothing but essential business for the period of the war. At least one eastern mill is accepting such replacement orders on a fairly extensive scale. Orders which the fabricators now are entitled to place represent one-sixth of the total tonnage shipped from their plants during the first six months of this year. Each month hereafter they may place a tonnage equivalent to that which they shipped during the preceding month. The mill now selling is accepting orders with the expectation of making shipment in about three months. It is making no assurances, however, since all orders with higher priority numbers booked in the meantime will receive prior attention. Several other shape mills are taking on some business but on a limited scale. It is expected that the 20,000 tons of fabricated shapes and plates required for the prospective plants of the Air Nitrates Corp. at Toledo and Cincinnati will be placed this week. The tonnage will be divided among several fabricators. About 2000 tons will be placed for immediate shipment and the remainder for various periods up to four months. No new structural tonnages of any importance have come up. Interest is centered chiefly in the 6200 tons for the Mare island structural shop.

Can't Supply Material

Cleveland, Aug. 13.—A shortage of shape tonnage continues to be shown and some of the leading producers are unable to make any further shipments this year. In orders for essentials being accepted by the latter the shape tonnage is being eliminated. Further sales of shapes rolled from shell discards are being made. One transaction in this district this week involved 1000 tons of channels which were taken by a jobber. Considerable inquiry for crane steel is current. One lot of about 600 tons covered 71 cranes for the army and navy most of which are for France and another of 200 to 300 tons, a special crane for the navy. Deliveries are being sought on another lot of 500 tons of crane steel. The Kuhlman Car Co. has been in the market for 500 to 600 tons of plates, shapes and bars for 50 cars for the Boston Elevated railway.

War Work Takes All

Chicago, Aug. 13.—Nothing is being considered in the construction line other than for war purposes. Contracts let during the past week involve 149 tons for an addition to the foundry of the Whiting Foundry Equipment Co., and 390 tons for an open hearth building for the Pacific Coast Steel Co. The General Motors Co. is asking figures on 1400 tons of steel for a foundry building at Saginaw, Mich., and the American tain 450 tons for a craneway at its Car & Foundry Co. is seeking to ob- St. Louis plant.

CONTRACTS AWARDED

Machine and assembling shop for Winther Motor Truck Co., Kenosha, Wis., 165 tons to Wisconsin Bridge & Iron Co.

Open hearth building for the Pacific Coast Steel Co., Portland, Oreg., 391 tons, to the American Bridge Co.

Addition to foundry building for the Whiting Foundry Equipment Co. at Harvey, Ill., 149 tons, to A. Bolters' Sons.

Government ordnance plant to be erected by Midvale Steel Co., Philadelphia, 3800 tons to the McClintic-Marshall Co.

Extension of forge shop, Midvale Steel Co., Philadelphia, several hundred tons to Levering & Gerrigues.

CONTRACTS PENDING

Foundry building for the General Motors Co. at Saginaw, Mich., 1400 tons.

Craneway for the American Car & Foundry Co., 450 tons, at its St. Louis plant.

Power house for Consolidated Gas Co., Baltimore, 700 tons, bids being taken.

Hospital, Roanoke, Va., 100 tons, bids being taken.

Priority Rules

Still Puzzle Wire Makers—Nail Tonnage Not Liberal

Cleveland, Aug. 13.—Various questions which have arisen under the new priority regulations, in their application to wire products remain to be cleared up. It is pointed out for instance, that the position of ship bolts is ambiguous, since all shipbuilding work takes a Class A rating and in the supplement to Circular No. 4, effective Aug. 1, nails, screws, bolts and nuts used for any purpose, are given a Class C standing. The situation on exports by jobbers also is not clearly understood. Wire makers combat the statement of the steel director to the jobbers that the supply of nails is so liberal that this product may be had without difficulty. They declare that the diversion of steel by government order from the wire mills to other war plants, has reduced the output of nails and other wire products. With the growing use of bessemer steel, for war needs, it is believed this shrinkage of production will be more pronounced.

Requirements Are Scrutinized

Pittsburgh, Aug. 13.—Makers of wire and wire products are closely scrutinizing all requirements regardless of source. Under the latest automatic priority regulations, even government orders have to be accompanied by endorsement of officers making requisitions, and there have been instances in this district where mills have returned orders in

the absence of this indorsement. Jobbers are required to make affidavits stating the exact purposes for which they are going to use material they apply for. It is uncertain how jobbers will fare under the ruling of the war industries board authorizing manufacturers to make replacement in August on a basis of the average monthly shipments from stocks for the first half of 1918. Owing to the scarcity of steel, many manufacturers have been unable to make shipments on replacements of even extremely small tonnages. As August replacements are to establish the maximums for future monthly orders, taking B-4 classification, the question has come up as to whether the tonnage the manufacturers shipped to the jobbers or the amount of stock ordered by the latter, becomes a basis for future replenishments.

Rush Rails

Order For France Given Right Of Way—Spike Needs Large

Chicago, Aug. 13.—In the purchase of 200,000 tons of rails for use of the government in France, the leading interest has been given approximately half, of which a large proportion has been placed with the western mill. Delivery on these rails is to be made within the next four months and part has been given to every rolling mill in the country in order to avoid congestion. Carbuilders who have been given an order for 10,000 small cars for use in France have not yet placed orders for their material, as some doubt exists whether this is to be furnished on allocation or purchase contract.

Japan Wants Tires

Philadelphia, Aug. 13.—Bids are being taken on 25,000 car and on 10,000 locomotive tires for Japan.

Many Spikes Wanted

Pittsburgh, Aug. 13.—Estimates have been made that approximately 30,000 kegs of 9/16 x 5½-inch spikes will be required in connection with the 200,000 tons of 80-pound rails recently placed with the mills for shipment to France. Nothing definite has been learned here as to when the railroad administration will place requirements for rails. According to reports, part of the rail capacity now devoted to the production of large shell rounds will be diverted back to its original line of manufacture. Makers of small spikes are accepting specifications more freely but are not taking any new business. Some makers of light rails are no longer quoting. Demand is fairly active.

Few Ferro Permits Issued

Committee Insists 70 Per Cent Metal Must be Used Generally—Switch 80 Per Cent Orders to Electric Furnaces—More Buying

New York, Aug. 12.—Permits to use ferromanganese containing more than 70 units of manganese, it is learned, are being granted by the subcommittee on ferroalloys only to consumers who submit satisfactory assurances that they are unable to operate with 70 per cent metal. Consumers who prefer metal having a higher content but acknowledge that they can get along with 70 per cent have been denied permits. Even makers of ordnance steel have failed to secure permits to use 80 per cent. As far as known, the permits granted for the use of more than 70 per cent metal have been to makers of manganese steel and number less than 12. These permits allow the use of metal varying from 74 to 80 per cent manganese, depending on the requirements of the particular consumer. Much difficulty is being experienced in arranging for the manufacture and delivery of material higher than 70 per cent. It is not practicable for the furnaces to change frequently from 70 per cent to higher content metal. It is likely that all 80 per cent metal needed will be produced in electric furnaces. To the makers of electrolytic ferromanganese, therefore, will be allocated such new orders as well as the old contracts which cannot be filled by the makers booking them originally. Just how to arrange the remuneration for the contract metal, much of which was placed at prices considerably lower than the present market, is a problem now engaging earnest attention. Incidentally, as set forth some time ago, all old contracts for 80 per cent metal, where no permit for the use of 80 per cent has been granted, will be filled with 70 per cent metal.

The letter sent by the subcommittee on ferroalloys asking consumers of ferromanganese, to close for their forward requirements, resulted in the transaction of considerable future business during the past week. This involved mainly last quarter and first quarter tonnage. Considerable inquiry now is pending.

Spiegeleisen is featured by unimportant sales at $75 a furnace for 16 per cent. Spiegeleisen is strong and difficult to get for prompt shipment. Fifty per cent ferrosilicon is quoted at $155 to $165, delivered, although there are rumors of lower prices. Ferrochrome continues at 35 cents furnace for 60 to 70 per cent metal containing 6 to 8 per cent carbon. Metal containing 4 to 6 carbon is quoted at 40 to 42 cents.

Demand both for ferrotungsten and tungsten metal powder has been good, and prices have strengthened. The market for tungsten powder ranges from $2.35 to $2.50 a pound for standard material. A sale of 15 tons of 78 per cent ferrotungsten is reported at $2.35, furnace, and another large sale of 72 per cent alloy at $2.50. A lot of 6000 pounds of 65 to 70 per cent fairly high in impurities, was offered at $2.25 warehouse. The market for 70 per cent may be quoted at $2.30 to $2.35 and for 80 per cent at $2.40 to $2.50. The government during the past week is reported to have bought 200 tons of Argentine wolframite and 200 tons of domestic scheelite at $24, delivered, per short ton unit.

Much Ferro Sold

Philadelphia, Aug. 13.—Much future ferromanganese has been sold by eastern makers mainly for first half delivery. Spiegeleisen is more active and one sale involved 1500 tons of 16 per cent for the first half. Some sizeable ferromanganese and spiegeleisen inquiries are pending.

Inquiries Are Put Out

Pittsburgh, Aug. 13.—Inquiries for tonnages of 70 per cent ferromanganese for delivery over the remainder of the current year and during the first quarter of 1919 are coming out somewhat more freely. Apparently this is partly due to the recent letter of James A. Farrell, chairman of the subcommittee on ferroalloys of the American Iron and Steel institute, addressed to consumers asking that commitments for ferroalloys be made reasonably in advance. The total inquiries in this district approximate 2000 tons. One consumer has taken about 300 tons for the first quarter of 1918 and another a similar tonnage for the remainder of this year. Both sales were made at $250, delivered. Another sale involves 100 tons for early shipment. A West Virginia consumer has taken 600 tons of 16 per cent spiegeleisen and a nearby consumer in Ohio 500 tons, the former for delivery this year and the latter for early delivery. It is said both tonnages went at $75, furnace. Unconfirmed reports are heard that this figure has been shaded slightly.

Must Insure Full Output of Steel

Government Addresses Itself More Vigorously to Problems of Providing More Adequate Supplies of Coal, Men and Transportation—Coal Tonnage Considered Basic Factor—Priority System of Labor Believed in Sight

WASHINGTON, Aug. 13.—Government authorities, who have finally accepted the contention of steel manufacturers that the steel problem is mainly one of distribution, have also come to the conclusion that if the present rate of production is to be maintained adequate fuel and labor supplies and transportation facilities must be provided. To this end developments are expected to the extent that new coal mines will be opened and operated, new rail lines built or extended, and labor provided for the new mines and roads and for the steady operation of blast furnaces and steel mills.

President Wilson has appealed to each coal miner and operator to "give his best work each day for the full number of work hours" in order that more coal may be mined to avert the threatened fuel shortage of the coming winter. This is one move to get more coal. The President also has before him the other plan, that of developing new coal fields. The President and all of his advisers are agreed that the entire problem hinges mainly upon the amount of coal taken out of the ground before winter sets in. It is believed the plan to provide new sources is rapidly nearing the point of being put into effect.

Want Full Steel Output

As pointed out in THE IRON TRADE REVIEW of July 25, the steel output of the country at one time this year was at the rate of 38,000,000 tons annually. That pace can be attained, steel men declare, if the fuel, labor and railroad problems are eliminated. The government realizes this rate of production is largely a problem over which the mills have little control. Months ago efforts were made to make the authorities see this point but it missed its mark. Now that the steel problem has become one of interest to every department of the government, a more attentive audience is to be had.

Steel men in their various pledges and promises to the war industries board have signified their willingness to enlarge their plants and to build new ones as rapidly as the need for the new output is shown. New capacities of considerable tonnage have been under construction for some time and these are gradually being put into operation. But in many instances, including some old established mills, production has been held back because of a shortage either of pig iron, fuel or labor. What use, then, it is argued, are new mills if the raw material supplies are missing? Then, too, when time is figured in for the construction of new plants or of additions, the effect of the desired tonnage would not be realized for months to come.

Relutant to Allow Extensions

The government would be reluctant, even were the manufacturers willing, to approve plans for new mill construction. The time, the labor, the money and the material involved would outweigh the benefits any such extensions might bring, it is held. It is true the war industries board approved a loan by the war finance corporation of $20,000,000 to the Bethlehem Steel Corp. and the capital issues committee approved new financing by the same company for a considerably larger sum. Application of the Woodward Iron Co. for a loan of $25,000,000 for plant extension now is under consideration. But aside from these, few if any similar requests have come from steel producers, although numerous applications by persons who would attempt to increase the iron and steel output have been made. Practically all of these have been rejected.

While the railroad problem has cut deeply into the steel output of the country, this is regarded as absolutely essential to the war. No one questions the need for locomotives and cars. The railroad administration a few days ago awarded the Lima Locomotive Corp. contracts for 15 more engines, making 60 to come from that company. This increases the total now on order from the administration for the roads to 1430. Just as rapidly as these engines can be delivered, more contracts will be placed and it is generally recognized the administration will be in the market for from 50,000 to 100,000 more freight cars as soon as the steel and other essential materials can be assured.

It has been hinted that the government has actually planned construction of more locomotive plants. To what extent this is true cannot be learned, but the latest report is that a loan of several millions is to be made the Lima company so that its output can be increased from seven a week to twelve. This last report also includes loans to the Baldwin and American companies, but the amount and details were withheld. The value of the rumors may only serve to show the government's hope of obtaining more power and rolling stock to fully meet the strain the war's continuance will bring.

As to the new coal mine developments, little could be learned. It has not been made public whether the government would loan money to operators for this work, do the work itself, or have some one develop the mines for the government at federal expense. It is quite evident, however, that more coal must be produced, either through stimulated production or through the operation of new mines and railroad extensions. The mine labor supply has been hard hit by the draft, by volunteer enlistments, and by the lure of more lucrative employment. Steps to offset the effect of these drains upon the supply are now to be taken. Fuel Administrator Garfield has long advocated deferred classification for miners the same as has been given ship workers.

Priority In Labor Indicated

A significant development in the labor situation came last week with the appointment of Felix Frankfurter, chairman of the war labor policies board, to a position in the priorities board. This is regarded as highly indicative of the coming of priority in labor, although as a matter of fact the distribution by the labor department of such labor as is being administered by it has already been along lines followed by the war industries board in giving priority assistance in obtaining raw materials. Definite announcement of this labor priority policy may be expected very shortly.

Another phase of the situation, which is met with a shudder when mentioned here, is the draft of labor. This is believed altogether likely to come, especially with the extension of the draft age limits to 18 and 45 years and with the drain which is to come with the induction into serv-

ice of an army of 5,000,000 men, as is contemplated by the war department.

The "limited service" men of the draft, men not physically fit for work in the trenches, are being trained and detailed to special civilian tasks.

Estimates of Fuel Needs Far Exceeded

Washington, Aug. 14.—Demands for fuel for the government and industries engaged in the manufacture of war material have so far outstripped federal estimates made in April as to astonish the fuel administration and lead to warnings that drastic conservation measures are imperative. The fuel administration in its statement says:

Almost daily applications are coming to the United States fuel administration from war industries for allotments of coal in addition to those made at the beginning of the coal year. Some are from new plants authorized by the war industries board, not known to the fuel administration at the beginning of the year. The requirements for these plants are in addition to the original allotments. Other demands are from plants already on the preferred list of war industries, for increased allowances because of enlargements and extensions to original plants made since the fuel administration compiled its estimates of consumption.

On April 1 the fuel administration allotted 10,000,000 tons for new ships. The shipping board now demands 13,000,000 tons. Three and a half million tons allotted for the navy had grown by July 15 to a basis of 6,000,000 tons, with the prospect of 9,000,000 tons by 1919. Bunker coal for the new merchant fleet estimated at 13,500,000 tons has grown to 21,000,000 tons.

New industrial requirements, representing an annual consumption of nearly 1,500,000 tons, are listed. These include among others 45,000 tons monthly of by-product coal for the Youngstown Sheet & Tube Co., and 27,000 tons monthly for the Cambria Steel Co., and 6000 tons monthly of producer gas and steam coal for the Worth Steel Co.

The fuel administration points out that the source of supply for the new coal requirements is within a limited coal area, where the mines were more than 14,000,000 tons short of their scheduled output on July 27. The extra demands call for coal from New River and Pocahontas low volatile fields of West Virginia, the low volatile fields of Pennsylvania and Maryland, and the high volatile fields of West Virginia, Pennsylvania, and Kentucky.

Not to Receive Turnings

Blast Furnaces for 30 Days Shall be Deprived of Such Shipments, Steel Committee Recommends, to Conserve Supply

BLAST furnaces excepting those making low phosphorus iron are to be deprived of the privilege of taking in shipments of wrought iron and steel turnings for the period of 30 days commencing Aug. 19 in an effort to conserve the shrinking supply of this grade of old material for operators of bar iron plants and open hearth steel works.

This is the recommendation made by the committee on steel and steel products of the American Iron and Steel institute in an announcement issued by Chairman Gary under date of Aug. 12. This action of the committee reflects the increasing stringency with regard to supplies of various grades of iron and steel scrap which is raising a problem of major importance for the iron and steel industry. In recent years there has been a growing practice among blast furnaces to purchase borings for the production of pig iron which has brought in a new form of competition for the iron mills and steel works. Some furnace plants also have been liberal buyers of borings.

Chairman Gary's announcement regarding wrought turnings, in full, is as follows:

In order that rolling mills manufacturing bar iron, and also open-hearth steel plants, may secure shipments of wrought iron and steel turnings, it is hereby recommended that for a period of 30 days, commencing Monday, Aug. 19 and expiring Sunday, Sept. 22, no wrought iron or steel turnings of any character be shipped to blast furnaces for the manufacture of pig iron, with the exception of turnings that are being used strictly for the manufacture of low-phosphorus pig iron by the following interests

Midvale Steel & Ordnance Co., Coatesville, Pa.; Robesonia Iron Co., Robesonia, Pa.; Northern Iron Co., Standish, N. Y.; Northern Iron Co., Port Henry, N. Y.; Cranberry Furnace Co., Johnson City, Tenn.; Delaware River Steel Co., Chester, Pa.; the Thomas Furnace Co., Milwaukee, Wis.; the Eastern Steel Co., Pottstown, Pa.

In the event of the turnings being of such nature that they cannot be used by rolling mills or steel plants, on presentation of these facts to:

W. Vernon Phillips, Chairman,
Subcommittee on Scrap Iron & Steel,
Pennsylvania Building,
Philadelphia, Pa.

a special permit may be issued for such shipment.

In cases where parties desiring to comply with this recommendation are now under contract for shipments of borings or turnings to blast furnaces it is believed that cancellation of pro rata portions of such contracts can be arranged on application to the chairman of the subcommittee on scrap iron and steel.

It is hoped that all interests concerned will rigidly follow this request as it is of vital necessity at this time.

Chicago Operations Good

Chicago, Aug. 13.—Steel mill operation has reached an excellent basis as to pig iron and steel production and finished material is being turned out in volume close to the best records of the past. While the total volume of shipments has not reached the highest point, records on individual mills are being broken from time to time. The fuel situation is improving, although no reserve for winter use is being accumulated. Allocations continue heavy and tonnages booked have been in excess of shipments throughout the summer. One effect of the present plan, which automatically gives priority, is that order departments find it necessary to go back to their contracts already on books on which deliveries have not been made and obtain affidavits on everything not covered by priority certificates. This is necessary in order to classify orders and place them properly with orders now being taken under the revised plan.

Will Build Hoop Mill

Plans have been formulated by the Acme Steel Goods Co., Chicago, for building a complete hoop mill. The plant will be located at Riverdale, on the Calumet river, near Chicago. The new mill according to President James E. MacMurray will be placed in operation about Jan. 1. Contracts for the erection of the 85 x 720-foot mill building have been let to the R. F. Wilson Co., Chicago. The mill and heating furnaces will be installed by the Morgan Construction Co., Worcester, Mass. Motor equipment will consist of one 2000-horsepower and one 1000-horsepower motors and several smaller motors approximating 500 horsepower. The hoops will be rolled into continuous lengths weighing about 220 pounds per bundle. They will be produced from 1 inch to 2½ inches wide and from 23 to 16 gage in thickness. Billets from 1¾ inch up to 2½ inches square will be used.

Interprets Priority Rules for Steel Buyers

Pittsburgh, Aug. 13.—The Pittsburgh Steel Co. is sending out to the manufacturing and consuming trade an interpretation of supplement No. 1 to Circular No. 4 of the rules and regulations of the war industries board governing priority in production. This company interprets the supplement as preventing it from accepting orders unless they fall within the classification of orders covered by priority certificates, orders taking automatic classification as provided in Sections 8 and 9 of Circular No. 4 and the supplement thereto.

In connection with orders covered by priority certificates, the letter urges the advisability of customers consulting with the company before applying for certificate. Orders taking automatic classification as provided in Section 8 of Circular No. 4 and the supplement thereto must be accompanied by an affidavit as provided on page 5 of Circular No. 4. Orders automatically classified as provided in Section 9, must be accompanied by affidavits as provided on Pages 5 and 6 of Circular No. 4.

The letter further states: "All other orders not embraced in these classifications automatically are classified as Class D. Before we can manufacture and ship orders falling within Class D, it is necessary for us to obtain a written permit from the director of steel supply. The scarcity of steel and steel products is so great that we have no material available for Class D.

"It is necessary for us to separate our orders and shipments into United States government, allied government and non-government divisions. Each order should state whether the material is required for the United States or an allied government. If only part of the order is intended for this use, please state what portion. An order that does not stipulate that it is for the United States or an allied government use will be classified by us as non-government."

Adds New Ovens

The Seaboard By-Product Coke Co. is adding a battery of 55 new Koppers ovens to its by-product coke plant on the Hackensack river, Seaboard, N. J., when the extension is completed the plant will comprise 165 ovens which are expected to have a total capacity for producing nearly 2100 tons of by-product coke daily.

New Ovens Started

The first of the two new batteries of by-product coke ovens of the Youngstown Sheet & Tube Co., at Youngstown, was lighted last week. The second unit is being dried out and will be ready for operation soon. The new ovens have a capacity of 1300 tons of coke daily which added to the output of the four units completed some time ago, will give the company a daily coke production of approximately 4000 tons. The government is looking after the supply of coal for the new units.

Will Make Spiegel

The firm of Frank Samuel, Philadelphia, associated with several other parties, has taken over the Leesport stack, formerly the property of the Leesport Furnace Co., Leesport, Pa. Repairs are now being made to the furnace and it is expected to have it ready for operation about Oct. 1. The present plan of the Leesport Iron Co., as the new organization will be known, is to manufacture spiegeleisen, although this is subject to change if it is found that some other metal can be made more advantageously.

Coke Is Directed

Pittsburgh, Aug. 14. (by wire.)—Diversion of coke shipments under the direction of the fuel administration during the past week has involved sizable tonnages. One large blast furnace interest was allocated 20,000 tons of fuel which a large producer was about to ship to another consumer on contract.

Fabricating of steel for 40 ships for the Merchants and Federal Shipbuilding companies is being done at the Trenton, N. J., plant of the American Bridge Co. Steel barge construction has been suspended for the time being.

The Non-Ferrous Metals

Copper Lead Spelter Tin

	*Copper	†Spot Straits, tin	‡Lead, New York basis	Spelter St. Louis basis	§Aluminum	Spot antimony
Aug. 7	26.00	.....	8.05	8.07½	33.00	13.12½
Aug. 8	26.00	.....	8.05	8.20	33.00	13.12½
Aug. 9	26.00	.....	8.05	8.37½	33.00	13.25
Aug. 12	26.00	.....	8.05	8.50	33.00	13.50
Aug. 13	26.00	.....	8.05	8.62½	33.00	13.50

*Government fixed maximum price for prime lake, electrolytic and casting copper, in ingots, pigs, slabs, etc., less than carloads, 27.30c.
†No spot Straits tin offering.
‡Price agreed to by leading interest and independents.
§Government fixed price for 98 to 99 per cent ingot aluminum in 50-ton lots; lots 15 to 50 tons, 33.10c; one to 15 tons, 33.20c.

NEW YORK, Aug. 13.—Indications that Japan is preparing actively for intervention in Siberia are reflected in the metal market here. A large Japanese inquiry for lead has been in the market but has not been accommodated, owing to short supplies of the metal. Japanese buying of antimony is being reflected in higher prices for this metal in the primary market at Shanghai, while spot metal is stronger here. Spot antimony was quoted 13.50c to 14c, duty paid, in New York today, while the price f.o.b. ship in the Far East is 14.50c. After adding insurance, freight and import duty, the price on futures would be approximately 16.50c, duty paid, New York.

The United States government last week inquired for 3000 tons of grade C spelter, for which the contract has been awarded but the details are not yet available. It is surmised the price was well below 8.50c, New York. There are rumors of shading of the government fixed price of 12c for grade A (navy specifications), the fixed price being 12c East St. Louis basis. The market for prime western spelter has been firm, owing rather to lack of pressure from sellers than to heavy inquiry. This market has advanced about half a cent the past week.

President Wilson officially has approved the continuation of the fixed price of 26c for copper until Nov. 1. Producers had made rather a strong argument for an advance, without success. The price on less than carload lots remains 27.30c.

The lead situation remains strained, the agreed prices being unchanged at 8.05c, New York; 7.75c, East St. Louis. Supplies are not more than sufficient to go around.

After violent fluctuations early last week, the market for Straits tin suddenly stopped at £387 10s, for spot in London, and £388 for three months' tin, c.i.f., London. The apparent pegging of prices gave rise to belief in some quarters that the price had been fixed on tin. A commission of three members, including John Hughes, chairman of the tin committee of the American Iron and Steel institute, is in London conferring with British authorities on tin. The prices of Banca and Chinese tin remain much higher in the primary markets than in this country. Spot Banca and Chinese on the Pacific coast can be bought around 93c, New York, but the price of Banca at Batavia, for August shipment is $1 a pound, while the price of Chinese No. 1 at Hongkong, for the same position, is about $1.06 a pound. Neither Chinese nor Banca for August shipment is now offered. Buyers also are hesitating.

The market for aluminum is unchanged at 33c for 98 to 99 per cent ingot.

DAUGHTERS OF FRANCE IN WAR PLANTS PROMOTE VICTORY

BY FRANCIS MILTOUN
Paris Correspondent of The Iron Trade Review

9 Rue Falguiere, Paris,
July 15, 1918.

THE first time I saw women employed in the metal industries in France was six or eight years before the war. In the famous De Dion-Bouton automobile factories they were running automatic screw making machines. I recently saw a more rude labor being performed by women in trousers in one of the great shipbuilding works of a port in France, where big hammers and electric cranes were manipulated with the touch of the hand of a duchess. The step between was a great one, and when the history of woman's war work is written that chapter devoted to their labors in the great metallurgical plants of France will not be the least interesting or important.

The question is raised in America as to whether women are needed in the metal trades. If they are not so employed now they will be, if the experience of England and France counts for anything. It takes six persons back of the line to keep a soldier going in the trenches, and supplied with the paraphernalia of war. In some of the ammunition plants in France 45 per cent of the workers are women, releasing many men for the sterner work of battle. The fact that women have to be trained for the work makes the process a long one but with the batteries of automatic and semiautomatic tools in use, the training period is reduced to the minimum.

The French size up the situation thus: By the solidarity of the technique of the army and the factory battles are won, battles which commence with the steel furnace, the steam hammer and the machine tools of the factories. France early learned in this war the necessity of massing labor battalions back of the line of combat. It was only after the war had begun that importance of factory labor really came to be appreciated and assigned its proper place.

In August, 1914, France threw the personnel of its trades and industries into the melting pot of mobilization on the front, leaving the factories bare, save those establishments which were virtually government arsenals. Without adequate protecting armor, it was as if her armies were going nude into battle. It was but a few weeks when she came to realize that to turn about was the only course which would enable her staying powers to tell in the long run, that is, by revivifying her factories by demobilizing her army to as great an extent as might be necessary and remobilizing these forces in the factories. The old French adage "Vanquish or die" now became "Work or die." Each rose to the highest expression with the fighter on the front and the workman in the factory.

One shell factory which did not exist in 1914 now covers vast acres, and employs 14,000 persons, 2000 more than the working population of the neighboring vast Creusot works in times of

Raises Problems of Future

THE very success of woman at her new occupation has brought about a state of affairs which is giving great concern to economists. It is no less than the possibility of being obliged to limit this labor in France that maternal instincts may be allowed to develop and thus make up the waste in manpower for future generations. France with a practically stationary population of approximately 40,000,000 is bound to consider this question, and the time will not allow of its being side-stepped despite material aid which future mothers have been giving in the factories producing war material.

Society will provide for the destiny of the mothers of France, and meantime France has the satisfaction of knowing that all the energies of its womanhood have been contributed to victory. They work in day and night shifts, coming often from miles away, often on foot or hanging on to the steps of a street car, and in the dull gray months of winter they are at their lathes, drill presses or planers at the same hour the outposts before the trenches catch the first glimmer of breaking dawn.

The daughters of mid-France who for 500 years have worked in the silk industry of the Lyonnais have now become iron and steel workers by a process of transformation akin only to that of the magician. The daughters of the golden hillside of the Romans, that rich red vineland of mid-France, have come from their looms where they wove gold threads into galloons of officers' caps and shoulder straps, to turn steel rods and bars into rifle shot, shrapnel and huge shells.

Upper—Girls and women filling shells in French ammunition factory. It takes six of these workers back of the lines to keep one man busy firing at the Boches.

Center—Women lacquering shells. This prevents the shells from rusting, thus preserving their high finish.

Lower—Chariot Electrique as it is called in France. This electric truck is shown in operation in a factory where the shells for the famous 75's are manufactured.

Forty-five per cent of the women of France are at work in munition plants. In many lines of the industry they are said to show greater skill than men.

peace. Taking the region of the Lyonnais as typical of this development, we find that it is in this region where the adoption of female labor in the iron and steel industries has been most marked, though in one form and another and in almost every part of France where war industries have been developed female labor has made enormous strides. I have seen a dozen of these usines, or factories, with men and women working side by side, each specializing in his or her work, but to all intents and purposes ignoring the existence of the other sex.

Well Fitted For Tasks

Except for the rough work of the foundries there seems little that woman has not undertaken in these French factories, from the manipulating of power presses which point the *obus* to the delicate mounting of the clockwork *fusées*. Particularly in the calibrage of shells has she been found to possess talents which not one man in a thousand has. Accustomed as are many

of these women of the Lyonnais to working in the silk factories their sense of measures of values and dimensions has been carried to a supersense. Of this class of labor one *usine* in this same region, employing 50 women previous to the war, employed 4900 women in the last of 1917, almost exclusively recruited from silk mill workers. One factory, specializing on "75s", cannon food here has half its personal made up entirely of the gentler sex.

The factories of the Lyonnais specializing for generations in the most luxurious of manufactured products, laces, ribbons and silks which have carried its name to the utmost corners of the earth, a veritable de luxe factory city has become a mere matter-of-fact steel city. Not a single industry of France today bears the slightest relation to its former processes and utilities. Wood, textiles, leather, chemicals and metals all are in a process of evolution and have left their former methods of fabrication far behind. Machines tended by the agile fingers of women have largely taken the place of the hand labor of men of but a few years ago. All former craftswomen have applied themselves here, even those who never before did anything useful. Those of the jewelry and the watch trades, where women were already largely employed, have been taken on in the ammunition factories as fast as they have applied and the ribbon weavers of the Forez are now fashioning rifles and cartridges. Chatellerault and Thiers, which formerly specialized in table cutlery, now confine their labors to trench knives and bayonets, and the ribbon looms of Saint Etienne are weaving lanyards

UPPER—POINTING SHELL ADAPTERS. LOWER—TURNING SHELL ADAPTERS. IN CERTAIN WORK CALLING FOR ACCURACY AND PRECISION FRENCH WOMEN ARE SAID TO HAVE TALENTS WHICH NOT ONE MAN IN 1000 POSSESS

for *fourragères* and bands for machine guns.

Regarding women in the ammunition factory it is undeniable that there can hardly be conceived a framing more incongruous than a great factory where ammunition or explosives are being manufactured. The extraordinary of yesterday becomes the ordinary application of today. While there was no lack of female labor coming forward for war work in France as soon as the need was made apparent there was a sort of unconcious pacifist propaganda going through the conservative press to the effect that the atmosphere of the factory would be found prejudicable to her health and the propinquity of her associations equally disastrous for her morals. Both these fears have proven to be bogies.

Certain peasant workers, those who assisted their parents in the shop, the garage or the saw mill had no fears, but the seamstresses, the artificial flower makers had an explicable apprehension which took a considerable campaign of publicity and the promise of five, six, or even eight francs a day, as compared with three as an average before-the-war wage at their regular trades. The daily wage of $1.60 as compared with 60 cents is a mighty lever in popularizing a movement. Another thing that helped feminine recruiting here in the beginning, and even more so today, was the falling off in the de luxe trades, and the fact that the wife of the poilu on the front was granted by the government but the insignificant sum of 25 cents per day, with 10 cents a day additional for each child. This was not much to keep body and soul together in these days of high prices. The munition factory scale was attractive.

Not a Man in One Factory

Today aside from the experts and the specialists, young boys of from 16 to 18, old men still capable of a full days work, and women of all classes, make up the day and night forces of the factories with an intensive production, per head, never known in France before the war. Coupled with those women who are actually producers at lathes and presses and tempering ovens and vats is another army of feminine labor. recruited largely from bourgeoise circles, stenographers, bookkeepers, calculators and inspectors. in each factory there is a *surintendante,* or female overseer, especially charged with looking after the interests of the women workers that they may have a guide, philosopher and friend of their own sex to stand between them and the stringent work regime as laid down by mere man. Chiefly her functions are such that the support is a moral one rather than material, but it was found necessary to have some such link as this as a part of the machinery of every well conducted factory working for government account.

Aside from the work on the more important heavy pieces by far the largest number of women in French factories are employed on shell fuses and other small accessories where a certain amount of deftness and skill is required in the assembling and regulating of these important details. At Marseilles you may find thousands of women workers. At Lyons, one establishment turns out 25,000 fuses and accessories a day and the work is entirely performed by women; not a man in sight. Some are earning as high as 8 francs ($1.60) a day and their numbers are increasing. Nearly 1,000,000 women, all told, are thus employed working for the various departments of the government.

In one factory producing shells of the famous "75s" I saw a young woman running one of those little electric baggage and factory trucks, another innovation in French factories, where usually all such handling of material in process of manufacture or finished product was accomplished by a none too efficient system of little hand cars on rails.

Cantines and *creches* for the children of these working mothers form an adjunct of all government controlled factories, and there have even been established apprentice schools where the woman workers are put through their first paces before actually going into the factories. At Marseilles, notably, is one of these schools founded by the *Inspection des Forges* of the ministry of war. Admission is by preference granted to widows or wives of deceased or wounded soldiers. Women are paid 60 cents a day while learning the various operation. In this school are women of all ages and conditions. The wife of a former professor in the University of Belgrade is an employe.

The entry of woman in the factories devoted to war work in undoubtedly a forerunner of a future prosperity in the industries of peace which will thus profit appreciably by the experience which they have acquired as specialists. It is probable, though, that many will swerve back to their former occupations, and if a just balance is arrived at, as is confidently hoped by those who are studying the question at close hand, the *service feminin* as developed in war time can but add to the prosperity and well being of the entire nation.

That the women of France engaged in war work are paternally cared for by the government authorities is shown by an investigation set in motion by a ministerial circular emanating from the ministry of war in the last days of 1917. Of 52 establishments under consideration, 20 possess as permanent children's refuge, or *creche,* as a direct adjunct of the factories in question; 14 have a more or less summary installation; 14 others were in process of formation; three had made arrangement with local established *creches*; while four only had no provision whatever and seven were not in a position to reply owing to the uncertainty of further orders. This investigation was a result of a query put forward by the commission of feminine labor with a view to assuring protection of children of working mothers.

Allied with the labor problem will come up the question of the feminine vote. It is to be hoped that the issue will not become wholly a political one as the economic phases of the question to be solved after the war are compelling enough in themselves to enlist the master minds of the industry and government circles alike.

France with a population of less than 40,000,000, with something more than 1,000,000 women working in her war factories, has made no mean showing as compared with Great Britain with 50,000,000, which according to Helen Frazer, an authority on woman's work in England, has but 1,250,000 female workers. The proportions are thus shown slightly in favor of France. a fact not generally recognized.

Book Review

Steel and its Heat Treatment, by Denison K. Bullens; cloth; 484 pages; 5½ x 9 inches; published by John Wiley & Sons, Inc., and furnished by THE IRON TRADE REVIEW for $4.

Present industrial activities are responsible for an unpreceded demand for technical information regarding the heat treatment of steel and for this reason the publishers have found it necessary to issue a second edition of Mr. Bullens' book. This edition has been broadened to include additional information of a practical nature to illustrate further the application of principles in everyday commercial practice and to encourage a consideration of every element in the cycle of operations from the initial heating of the steel for forging to the cooling in the final heat treating process.

The work is well written in comprehensive language and 285 illustrations are included. Of special importance in the chapter which explains in detail how the human element influences the heat treatment of steel and how errors arising from this cause are best avoided, a complete cross index is included which enables the busy man readily to find any special subject desired.

Canada Furnishes Reclamation Plan

Neighboring Country's Effort to Reclaim for Industry Many Thousands of Wounded Soldiers Brings Astounding Results—Re-education an Important Factor—United States May Adopt Similar Methods in Near Future

BY W. H. LLOYD

IN the United States, widespread attention recently has been directed to what Canada has accomplished and plans to accomplish in reclaiming for industry the returned maimed and wounded soldiers. That nation, 500,000 of whose young men volunteered before ever conscription was considered, has perhaps led the world in arranging to so repair its heroes that they not only are able to assume either their accustomed duties or duties for which they have been fitted, but, what is vastly more important, that they have the will to do so.

Keeping Up Morale

Canada's aim has been to combat any feeling of resignation on the part of the soldier who may feel that there is no useful place for him. So successful has that nation been in this field, that even soldiers without arms or legs are taking up the work cheerfully. At present in Toronto alone, 500 maimed soldiers are quartered. Some of them are minus an arm; some have lost both arms; some a leg; some both legs; while a few are minus both arms and legs. This reclamation work is in the hands of the Canadian provincial government and while accepting volunteer aid of all kinds, no official or semi-official organization such as the Canadian Red Cross or the Y. M. C. A., is identified with the effort.

Because casualty lists are now finding a regular place in American daily newspapers and wounded American soldiers already are arriving home from overseas, interest in this subject on the part of industry is growing keener. Labor shortages, existing and increasing because of further calls to build the large army needed in France, make the reclamation of the wounded who return a matter of commercial importance, entirely aside from the humanitarian viewpoint.

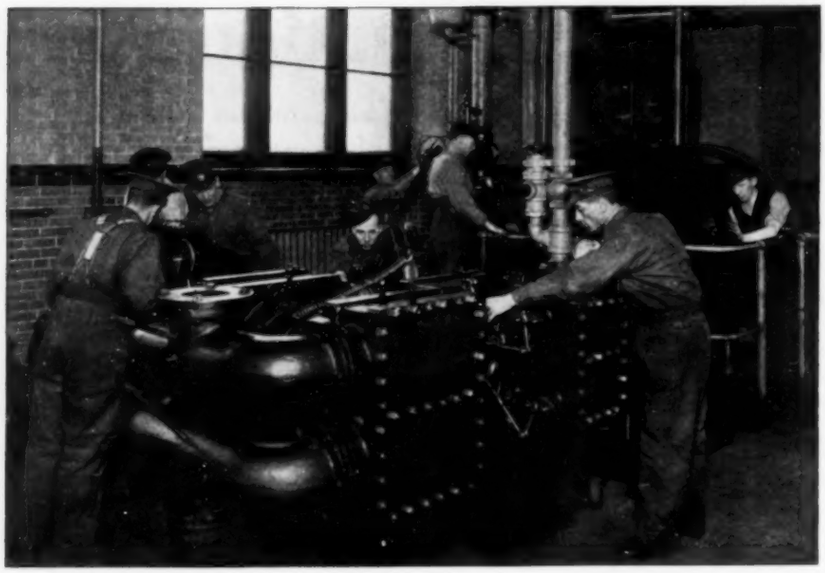
For some time, the Creusot works in France of the Schneider brothers, or "Les Etablissements Schneider" has maintained as a part of its gigantic institution, a reclamation hospital. It is fully equipped with the apparatus required to restore broken down nervous systems, or the use of limbs paralyzed or partly so from shell shock. Here workmen who have served upon the battlefield are repaired and reclaimed to take their places in productive industry. Already in this country, some such similar work is contemplated on the part of the iron and steel industry. Large plants are considering the advisability of installing such rehabilitation equipment as a necessary war measure, along with their regular welfare work.

More than 18,000 of her sons have returned to Canada, wounded, maimed, gassed and shell-shocked. In excess of 31,000 additional casualties have been reported from overseas, a large proportion of which number will soon be invalided home, incapacitated for further service on the battlefield. Preparations are being made to receive them.

Reclamation Plan Thorough

Today Toronto is the center for human reconstruction work. It has sent approximately 65,000 volunteers to the front and now has a list of 5000 dead and 15,000 casualties. At the Hart house in Toronto, Prof. E. A. Bott of the University of Toronto with his staff, has a large and varied number of machines, electric and otherwise, to develop again the muscles and nerve centers of the wounded and shell-shocked men. Professor Bott is a pioneer in the work of inspiring the maimed with the desire to live and with the will to do for themselves. Since no two soldiers have suffered the same disability and since no two men are alike in mental caliber or inclination, the problem he faces is immense. Ortho-

MISSING ARMS NO LONGER BAR RETURNED SOLDIERS FROM A COMMERCIAL EDUCATION IN TORONTO SCHOOLS. MANY THUS ARE ABLE TO GRATIFY LONG-STANDING AMBITIONS



VOCATIONAL TRAINING AT McGILL UNIVERSITY LABORATORIES, TORONTO, ONT., FITS RETURNED SOLDIERS TO BE STEAM ENGINEERS

pedic hospitals have operated in the past but in them the exercise of stagnant muscles has all been done by attendants. Professor Bott devised gages and indexes, with weights and pulleys, which after being attached to a finger, hand, toe, foot or leg indicate progress made from day to day. A soldier who comes in absolutely convinced that a certain member is useless permits the apparatus to be attached. Soon, however, after much urging and coaxing, he may see the indicator move a trifle after many trials and then he becomes eager to move it more. Numerous machines for muscle development have been devised and the fitting of artificial limbs has become an art followed by a pleasing measure of success after much practice and teaching. The men are taught to use artificial legs and arms in a most natural manner.

Vocational Training Necessary

Conjointly with, or as soon as permissable after the restoration of minds and nervous systems, and the substitution of missing members, vocational guidance and training has been furnished the returned Canadian soldiers. It is called re-education in Canada. This work is centered in the Central Technical institute in Toronto. This is the second largest technical school in the British empire and has one of the finest manual training workshops in the world. These have been turned over by the city to the province and the school's principal, Dr. A. C. McKay, is directing the work, not as a Toronto citizen but as a duly accredited agent of the province of Ontario. Such activities are under the control of the Soldiers' Aid commission. From the Central Technical alone, before next September, approximately 1200 men will go out, eager and able to do men's work, who ordinarily and without this or similar training would have been human wrecks and charges upon their several communities. Dr. McKay states that this school is turning out the most painstaking, industrious and efficient workmen in all Canada. In excess of 500 have already been placed in congenial work and manufacturers are always calling for more of the same sort.

Studies Cover Wide Range

The studies offered at the Central Technical are sufficiently varied to suit the most particular soldier who wishes to re-enter civil life to his signal advantage. Practically each week, finds some new line added to serve some new pupil whose inclinations or whose physical condition demand it. A few of the subjects in the curriculum follow: Typewriting, shorthand, civil service, bookkeeping, elementary education, telegraphy, mechanical drafting, woodwork, shoe repairing, salesmanship, music, power plant work, machine shop, motor mechanics, gas engines, tractors, stationary and electrical engineering, linotype and monotype operating, oxy-acetylene welding, industrial chemistry, graining and stenciling, machine designing, plumbing, pottery, painting and decorating, mining, milling and assaying, cabinet making, sheet metal work, art and design, airplane assembly, blacksmithing, sign writing and many more.

Vocational Study

In addition to this particular school, each hospital maintains a vocational department since this training must necessarily go hand in hand with many prescribed medical treatments. In every hospital, the patient reports to the vocational officer in exactly the same way that he reports to the medical officer. The vocational officer studies him and advises the patient as to a suitable course to pursue. In many cases, lifetime dreams have been realized as opportunities have been presented to take up the work the men most desired but which have previously been unattainable.

Committees have been and are being formed in the United States to study this problem. Not long ago a delegation of Cleveland business men, made a tour of Toronto to learn what is being done. They returned with a fund of information by which they will be guided in their work of replacing re-

WITH RIGHT LEGS MISSING, THESE MEN ARE TAUGHT THE CARPENTER'S TRADE AT DAVISVILLE ORTHOPAEDIC HOSPITAL, TORONTO, ONT.

turned soldiers. Commissions are being sent abroad to study conditions there so that the United States may learn from the experience of others how to meet this vital industrial problem.

Work Commences in United States

Recently a committee was formed in the United States to act along the lines followed in Canada. Among the 40 men on this committee were: H. P. Claxton, commissioner of education, chairman; Allen Walker, chamber of commerce of the United States; Majors H. E. Mock and W. A. King, surgeon-general's department of the army; R. D. Jones, war risk insurance bureau; Dr. C. A. Prosser, federal board for vocational education; J. W. Sullivan, department of labor; R. M. Little, chairman of the compensation commission; Judge Mack, treasury department, representing Secretary McAdoo; Dr. Royal Meeker, department of commerce, and N. B. Williams, counsellor for the national association of manufacturers. This committee drafted a vocational rehabilitation bill, which now is before congress. This bill provides that every person discharged from active service shall upon order of the war risk bureau, follow such courses of vocational education as the board for vocation and rehabilitation shall prescribe and provide. This board's task is to re-educate and rehabilitate for civilian or rather industrial life, the returned soldier. Statistics from other countries show that fully 80 per cent of the permanently disabled men can be reclaimed. Based on those statistics, which show that 10,000 men per 1,000,000 soldiers become subjects for rehabilitation per annum, the United States will have 30,000 subjects in the next year, since an army of 3,000,000 is planned.

Many Hospitals Being Built

Fourteen of the general hospitals being constructed by the war department in as many different sections of the United States are intended to be reconstruction hospitals. From them these erstwhile cripples will go forth restored to their fullest usefulness. Each hospital will have workshops in connection where trades will be taught and practiced. Gardens and farm lands will afford activity for those not fitted for other branches of industrial activity. Every possible facility is being installed to encourage the cripple to do his utmost toward self-restoration. A corps of instructors in physical training will be in attendance at each. These are known as "reconstruction aids" whose task will be to drill the crippled men in the fullest use of their serviceable muscles, to the end that they may exercise their faculties to the utmost. The general plan contemplates the sending of the returned crippled soldier to the hospital nearest his home.

A wide scope for the effort is therefore seen. Already civic, state and cantonment hospitals are receiving and are being prepared to receive these returned soldiers to turn them from hopeless heroes into useful citizens. In one two weeks' period recently 185 sick and wounded men of the American expeditionary force were returned to the United States for treatment. The men were sent to reconstruction hospitals.

Henry Ford already is at work on the erection of a rehabilitation hospital in Detroit. In the purchase of materials for it, the government is co-operating and it is being constructed in record-breaking time. It will be one of the most compelte hospitals in the world.

On a 20-acre tract the hospital, which will bear Mr. Ford's name, will have floor space of 50,000 square feet. It will be a four-story structure with the exception of the diagnostic building placed in the center which will go up to six stories. The cost will be $3,000,000.

To Cure Shock Victims

According to an announcement made recently by the national committee for mental hygiene, a war emergency course has been established at Smith college, Northampton, Mass. It will prepare workers to assist in the reclamation of soldiers suffering from nervous and mental diseases, due to shell-shock or war neuroses. It is claimed that the prevalence of these disorders is unprecedented in the present war. A part of the announcement reads:

All of the allied nations have had to provide extensive facilities for dealing with these cases. Many of the disorders yield readily to treatment which requires the use of civilian aides as well as medical specialists to restore the men to mental soundness and to enable them to adjust themselves again to civil or military life.

While its effort will be entirely subservient to that of the government, Cleveland is preparing in a large way to engage in this humanitarian task. The Association for the Handicapped has been organized in that city to coordinate the work of various relief bodies.

More Facilities Planned

Plans and figures, showing what Cleveland hospitals could do in the care of wounded soldiers have been sent to the war department. These show that existing hospitals could, at short notice, care for 500 soldiers without hardship to present patients. Additions which could be made in a short time would provide for 5000 more.

It is not possible to give even a brief resume of the activities along this line which are engaging the attention of executives and industrial leaders alike, all over the country. Suffice it to say, preparations are being made to treat the soldiers who come back, in harmony with the way they are being cared for while performing military duty. Many will be fitted for positions better than those they had before they left. Many will have ambitions gratified that have been hitherto denied them. Thus the whole race will be better for the experience and that in this great humanitarian enterprise will be found one of the wholesome things to come out of the war, is the opinion of these who are closely allied with the movement.

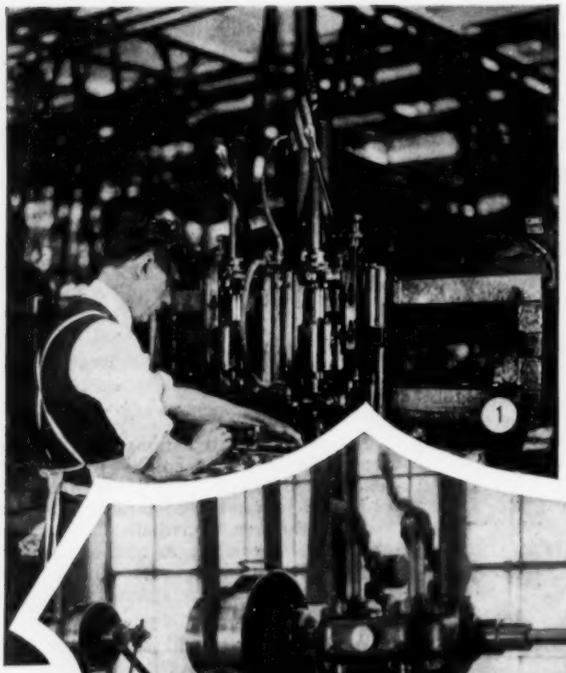
How to Reclaim Wounded American Soldiers

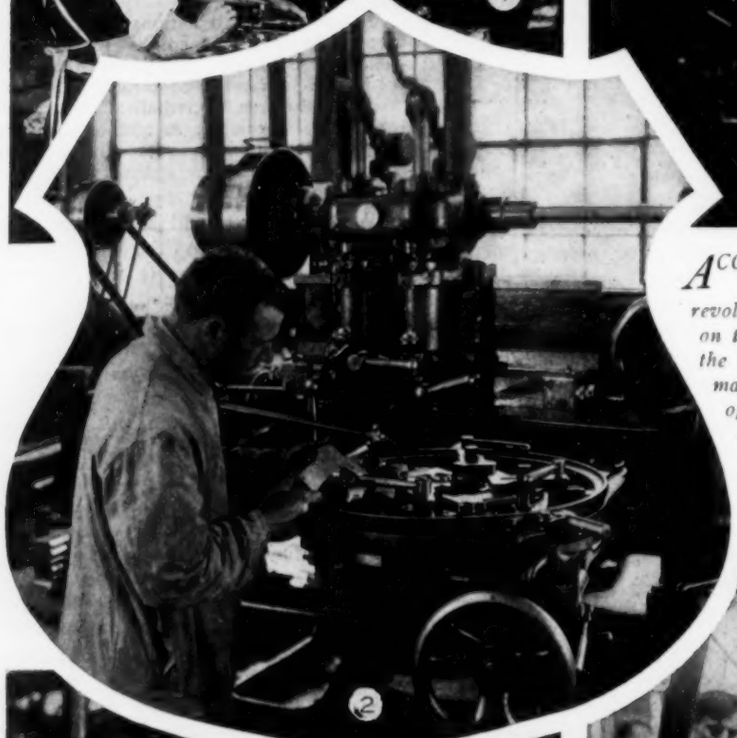
CASUALTY lists in the newspapers 16 months after the United States entered the war arena, have been greatly augmented in recent weeks. The total has mounted as steadily as the American expeditionary forces have forged ahead from the Marne. It is the price of conquest. As yet, however, the figures are small as compared with the gigantic losses of the other allies. A list taken from a recent newspaper reads as follows:

	Previously reported	Reported Aug. 5	Total
Killed in action..	2,816	468	3,284
Lost at sea.....	291	0	291
Died of wounds..	907	81	988
Died of disease..	1,514	9	1,523
Died of accident & other causes.	616	7	623
Total deaths....	6,144	565	6,709
Wounded in action.	8,264	148	8,412
Missing in action, incl. prisoners..	788	3	791
Grand total....	15,196	716	15,912

They loom large, however, in the minds of those connected with the soldiers represented by such impersonal figures. The increase in these figures as the war continues, will drive home a lesson which is now imperfectly understood. Industry, for instance, has a direct interest in the figure opposite "wounded" representing more than half the total, since here is room for much reclamation. Cries of labor shortages are being heard and will be heard as additional drains upon the country's manpower are made to increase the army. How these wounded can be reclaimed for industry is the question confronting industry today. What Canada has done and is doing along this line can well be used as a guide in the months ahead, when the problem of caring for the returned wounded, maimed, gassed and shell-shocked soldiers will demand prompt solution.

In Mars' Busy Work Shop



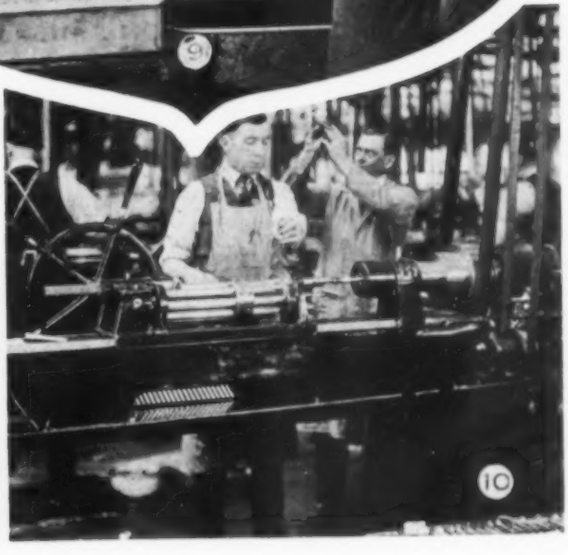


ACCURRACY and speed characterize the work in this factory devoted entirely to the production of Colt revolvers for the United States army. Fig. 1, profiling on top of slide for rear sight. Fig. 2, first drilling on the receiver. Fig. 3, first milling on the barrel. The machine automatically cuts nine barrels in a single operation. Fig. 4, hand profiling on the receiver. Fig. 5, punching operation on receiver. This plant is rushing work night and day to produce weapons for our rapidly-increasing army.

(Photos by committee on public information)

Making Colt Revolvers For U.S.A.

GIRLS are performing a real service for Uncle Sam in entering the industrial field in ever-increasing numbers. In Fig. 6 girls are shown grinding barrels, an operation requiring great skill and in which they display considerable proficiency. The welding operation on the machine is shown in Fig. 7, the seam being so finely welded that it is almost impossible to detect where the joint is made. Fig. 8, milling bottom on the receiver. Fig. 9, automatic profiling on receiver. Fig. 10, chambering the barrel.
(Photos by committee on public information)



Producing Bitter Pills For Fritz

Ordnance Comprising Armor, Shells and Cannon is Based Upon the Scientific Treatment and Fabrication of Steel—Ingots and Forgings Require the Most Painstaking Attention to Prevent Subsequent Rejections

BY GEORGE SATTERTHWAITE

ORDNANCE is a generic term, and while technically it may be correctly applied only to certain heavy guns, it has come in the popular mind to include practically everything with which a soldier or an army or a navy makes war upon his enemy. Here ordnance will arbitrarily include cannon, shells, armor and miscellaneous.

Under cannon will be included rifles, both small and large, howitzers, mortars, trench mortars, etc. Under shells, armor and deck-piercing projectiles, high explosive shells, shrapnel, gas shells and, in general, everything that is propelled by any of the various weapons included under cannon for the purpose of doing damage to an enemy situated at a distance. Under armor will be included everything from the thin steel shield or helmet to the heaviest port plate armor of the battleship.

Ordnance forging here will mean the semifinished article out of which by further machine work and assembly with other articles or parts of articles, is made the finished piece of ordnance. The name gun forging has come to mean the rough machined, heat-treated and accepted part of a cannon, whether tube, jacket, hoop or breech part.

Mechanics and Metallurgy

The manufacture of ordnance forgings made of steel involves the following steps: Making the ingot of suitable size, shape, composition; forging the ingot to the shape desired; heat-treating, including annealing, quenching, drawing and testing; and machining. In these steps it is necessary to co-ordinate mechanics and metallurgy.

The metallurgical principles involved are simply in themselves but the application of these simple principles to the large masses of metal required in ordnance work, and the elaborate and ponderous mechanical devices necessary in carrying out the metallurgical prescription, call for skill and experience. For instance, the heat treatment of a gun forging consists usually of three steps. An anneal is required after forging, usually at a temperature above the critical temperature, to relieve forging strains, to secure the desired degree of grain refinement and to soften for machining. The forging must then be quenched in some medium from above the critical temperature. It is then drawn to relieve the quenching strains, and to give the desired physical properties.

Bulk Complicates the Problem

These are some steps that are applied in the heat treatment of an automobile axle weighing 50 pounds, but their application to a large gun tube, 65 feet long, weighing 75,000 pounds, calls for engineering skill.

The art metal worker who shapes by hand on his anvil need not know much about the metallurgy of iron, but he must be a skillful mechanic. The making of millions of wire nails or tacks a day is not a serious metallurgical problem but requires mechanical ingenuity. The making of a good car axle involves more metallurgical consideration than the two former examples, but does not call for any great skill or knowledge in this science. The making of thousands of shrapnel or high explosive shell bodies per day on one machine is primarily a mechanical problem, though much consideration must be given to metallurgy. But the making of armor piercing projectiles, armor plate and gun forgings requires first of all a thorough understanding of metallurgical principles and the skill and experience necessary to combine those principles with the oft times difficult mechanical problems.

Making the Ingot

Ingots for ordnance forgings are usually made in the open-hearth furnace, though under certain conditions the electric furnace and the crucible methods are used. Originally the crucible was used almost entirely for making all high grade steels, but as a crucible pot rarely holds more than 100 pounds of metal, it can be seen how difficult it would be to make an ingot weighing 100,000 pounds by this method, though up to a few years ago a prominent foreign ordnance maker did make large ingots from the crucible, this being possible only by using a great number of men carefully trained and drilled.

Recently the electric furnace has been used for making ingots for ordnance forgings, but as they are usually limited in capacity, the open hearth remains the principal means of making ordnance steel. The most popular size is the 50-ton open hearth.

Consideration must be given to the design of the furnace for ordnance work particularly to the shape and dimensions of the hearth. It is

A Cycle and a Paradox

WHEN the kaiser's grey clad hordes swept through martyred Belgium early in August, 1914, another turn of an endless cycle was marked. The supposedly impregnable fortresses such as Liege and Namur, sheathed in armor plate, were smashed by heavy projectiles. Temporarily the high explosive shell was in the ascendancy and the German army rolled forward until stopped and hurled back at the Marne. Then they encased themselves in elaborate trenches, which were duly advertised to be marvels of protective genius. Protective covering, though, in this case, not armor plate, was ascendant. But the cycle again proceeded. The allies' heavy guns blew the dugouts and trenches to bits and the tanks, protected by their armored covering, routed out the survivors. High explosive shells gained the advantage, which the armored tank held. Thus in endless succession of changing supremacy, the cycle is marked. The impenetrable armor is pierced and crushed by the shell which no armor can resist. Mr. Satterthwaite in the accompanying article comments on this paradox and gives valuable information on making forgings for these insurmountable classes of ordnance.

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necessary to secure a satisfactory relation of the length width and depth of the bath. In general, however, any well designed furnace can make good ordnance ingots. As the acid bottom is more generally used than the basic, great care must be exercised in selecting the proper raw materials to meet the chemical specifications, and to insure the necessary purity of the steel. The secret of making good ordnance ingots lies in the proper handling of the metal in the furnace and in the meth of pouring. In my belief, the making of the ingot is by far the most important step in the manufacture of ordnance forgings.

Qualities of a Gun Ingot

A good ingot will make a good gun forging, but all the skill in the world in the other departments cannot make a gun forging out of a poor ingot. A few of the many important points in making good ordnance ingots cover the method of solidifying or killing the heat, the addition of finals, the temperature of the bath, the kind of slag, the time of holding in the ladle, the top or bottom pouring, chilled or sand mold, big or little end up, hot tops, rate and temperature of pouring. The most minute and careful attention must be given to each of these points, and their relation one to the other, if good ingots are to be made. Even after a satisfactory procedure is laid down and established, it requires eternal vigilance to keep the established practice. There must be the strictest discipline in the open hearth to see that each step is properly carried out by the workmen, few of whom understand or appreciate the importance of their instructions. Up to the present time, the manufacture of ordnance has not been a production problem—rather a specialty. The orders in the past were for ones or twos or dozens of an arm; but in these days, where thousands and millions are required instead of ones and dozens, tremendous pressure must be brought to bear to keep quality ever uppermost. The only production that counts is the production that goes out the gate in the form of finished material. In ordinary times it is poor business, and in these times unpatriotic, if not criminal, to drive the open-hearth department harder or faster than it can make ingots that will pass the succeeding steps of manufacture successfully. Unfortunately, it is impossible to tell whether an ingot will make a good piece of ordnance until after it has passed through all the steps of forging, heat treating and machining, until after all the money and human energy has been spent upon it. Manufacturing schedules should be so arranged that there will be the minimum amount of work in process, and that there will be the minimum amount of time between the casting of the ingot and its acceptance after machining and heat treatment. The failures in ordnance forgings that come from faulty heat treatment can always be corrected by retreatment requiring little loss of time or money, but the failures that come from poor ingots seldom if ever can be cured by the most elaborate heat treatment.

Mechanical devices used for forging may all be included in the three classes—presses, hammers and rolling mills. In forging ordnance the hydraulic press is used most extensively, the steam hammer next and the rolling mill least. The steam hammer and the rolling mill are too well known to require description. The hydraulic press, however, is a comparatively modern means of forging steel, though the principle is old. It consists principally of two heads —top and bottom, connected by two or four columns or bolts, a cylinder or cylinders, and a ram, actuated by water or other liquid under high pressure, controlling valves, etc. The important advantages of the press for forging are that it is self contained and requires no enormous foundation to take the blow, and that there are practically no limitations to size and power. There is at least one press in existence of 20,000 tons capacity and many of 10,000 tons, the range being from one or two hundred tons up. There are at least four types of presses, the principal difference being only in the method of securing the necessary pressure of liquid in the cylinder. They are: Whitworth type, the Davy or steam intensifier type, the hydraulic intensifier type, and the accumulator type. The Whitworth type uses a high pressure hydraulic pump driven by steam engine or electric motor directly connected with the press cylinder by means of heavy pipes and controlled by a powerful valve, actuated itself by high pressure water. The Davy or steam intensifier press is operated by a large steam cylinder, the piston rod of which has an extension which operates in a small hydraulic cylinder, which is connected with the main press cylinder by means of pipes and valves. By the proper relation of steam pressure, diameter of steam piston, and diameter of hydraulic piston, the desired hydraulic pressure in the cylinder of the press itself is attained. The disadvantages of this type of press are the shortness of the effective power stroke (from 5 to 7 inches) and the heavy steam consumption, though the latter may compare favorable with the steam consumption of the hydraulic pump used with the Whitworth type of press, which necessarily uses steam or electricity while idling between power strokes.

In the other two types the accumulator is used. This is a vertical cylinder, the piston or plunger of which is weighted down to give the desired pressure, usually not over 2500 pounds per square inch. By means of valves this water is admitted directly to the press cylinder or through one or more hydraulic intensifiers. These presses are admirable for certain classes of work, but are generally slow acting or of short effective stroke.

Heavy Handling Equipment Used

As many of the pieces of guns or armor require ingots weighing from 100,000 pounds to 200,000 pounds each, and armor ingots frequently to 300,000 pounds each, it is necessary to provide, in addition to the forging itself, powerful and elaborate handling and manipulating devices. These usually consists of overhead traveling cranes, chucks, mandrels, porter bars, sling chains, cutters, etc., besides the usual electric auxiliary cranes. For lighter work the electric manipulator, when properly designed and constructed, is most satisfactory, particularly if it is hung from an overhead runway.

Steel for ordnance should be brought slowly to the proper heat, not over 2200 degrees Fahr., and preferably about 2100 degrees Fahr., after which it should be allowed to soak until it is certain that the entire body of the ingot from center to outside, from top to bottom, is at a uniform mellow heat. The ordinary soaking pit practice commonly used in the manufacture of rails, structural steel and commercial bars is not exact enough for ordnance.

In handling the larger ingots used for making parts of big guns and armor plate, the manufacturing schedule is so arranged that the piece is never allowed to get entirely cold from the time the metal is poured into the mold until the finished forging is annealed. In other words, the ingots are taken hot from the open hearth and charged immediately into the heating furnace at the press —though preferably, from a production standpoint, they are sometimes charged into a preheating furnace before being placed in the heating furnace.

It is unwise to allow a nickel or nickel chrome ingot of larger section than 40 inches diameter to grow cold without annealing.

Forging Problems

Ordnance forgings are of varied size and shape, some being plain round cylinders and others being square, rectangular or with lugs. Armor plates for battleships, which are almost always plain rectangular plates, are comparatively easy to forge, except for the difficulties encountered through their great size and weight. Shells and projectiles are forged hollow or solid, depending on the circumstances. Gun tubes and hoops are forged both solid and hollow, the determining feature being relative speed and cost, rather than metallurgical reasons. Inasmuch as gun forgings are almost always tested transversely to their axis, it is well to work the metal transversely wherever possible, either by upsetting or by expanding on a mandrel.

After forging, the next operation is annealing. This is to relieve forging strains, refine the grain and soften the steel for machine work. The particular formula to be used in annealing will depend upon the size and thickness of section, the temperature at which it left the forging tool, and the composition. The usual treatment consists in heating the piece to a point above the critical temperature, holding at this temperature for a sufficient time to insure uniformity from end to end and from center to outside, and then cooling either quickly or slowly, depending on circumstances. Sometimes a crude quench is combined with the annealing, by heating further above the critical temperature and cooling in air to a temperature below the critical, followed by another heat to a lower temperature, but above the critical, followed by a slow cool. To secure extreme softness for machining, this may be followed by an anneal from a temperature just below the critical.

Controlling the Anneal

These annealing operations on gun forgings are usually performed in an ordinary box furnace, with lids or covers for charging and discharging. This type is sometimes called a "bung-top" furnace. Any fuel may be used, but crude oil is usually employed, with suitable burners, at intervals along both sides. It is, of course, very important that the forgings are heated uniformly and to determine this, pyrometers are inserted at suitable places, the number depending upon the length of the piece and the accuracy desired.

The next step in manufacture is the rough machining. Depending upon the size and shape of the pieces, they may be machined to the final rough machined size before the quenching and drawing treatment or given a preliminary machining. The final rough turning and boring is performed after acceptance for physical properties. In either case the operations are almost identical. The tools used in rough machining gun forgings are turning lathes, boring lathes, planers, shapers, slotters and occasionally milling machines and horizontal boring mills. In machining the medium and larger sizes of gun forgings, heavy duty machines designed and built for the purpose must be employed if large production is to be secured.

In general the surface skin of the forging should be removed, together with all surface defects contained therein; otherwise, a crack may start in the subsequent heat treatment. Sufficient machining should be done to reduce the section as far as practicable, but the minimum amount of expense should be put on the piece before it is accepted, otherwise this work may be entirely wasted, due to the failure of the tests. Judgment based upon experience will have to determine this point.

Boring Problems

In boring from the solid long pieces, such as gun tubes, double-ended boring machines are used successfully, though care must be used to have the holes match properly. The larger of these machines sometimes have hydraulic feed to the boring bars with screw release, thus throwing the heavy load off the lead screws. The designs of cutter heads and cutters vary in different shops. All, however, agree that large quantities of boring compound or lubricant at high pressure should be used, not only to keep the cutting edges cool but to wash away the chips, which if allowed to remain cause jamming and breaking of cutters and cutter heads. The rough machining of ordnance forgings is the easiest of the four steps and requires no metallurgical skill or knowledge, but does require considerable mechanical skill and experience.

The fourth step in the manufacture of ordnance forgings is the heat treatment. This has been briefly referred to previously and consists primarily of quenching in some cooling medium from a temperature above the critical, followed by a draw at the proper temperature to give the desired physical properties. In the case of gun forgings, which, of course, are hollow, good practice calls for the heating for quenching in a vertical position and dipping in oil or other liquid in the same position. As in the annealing furnace, these vertical quenching furnaces are usually fired with crude oil, the burners being arranged to give uniform heat without direct contact between the flame and the forgings.

Annealing Furnaces

In size these vertical furnaces vary from 6 feet to 12 feet inside diameter and from 10 feet to 100 feet inside length. The charge is usually suspended on dogs which are hung from the furnace binding. The furnace is charged and discharged through the open upper end, which is covered during heat with a lid or cover capable of being removed quickly; this may be done by any suitable mechanical means. In the longer furnaces it is sometimes considered desirable to have a long, side-opening door the entire length of the furnace, the door section in a circular furnace being about one-third of the circumference. The advantage of this type of door is the saving in time in getting the piece into the quenching bath—a consideration of great importance; also a saving in head room.

The heat treatment of a gun forging depends upon the same simple metallurgical principles as the heat treating of an automobile axle, the difficulties arising only from the usually great size and weight of the pieces. Here is where engineering skill and experience are required, to devise the proper arrangement of cranes, hoists, furnaces and tanks, so that the piece when ready may be removed from the furnace and immersed in the quenching medium in the shortest possible space of time, and may be removed from the bath promptly and quickly when the proper time has elapsed. As the immersion occupies only a few minutes, the forging is held by the crane during this time.

Quenching and Drawing

Various quenching mediums are employed from oil to chilled water, the former being the most common, though for the symmetrical pieces water may be used if great care is exercised to prevent cracking. Water is more drastic and more effective, but also more dangerous, and its use cannot be recommended indiscriminately.

The drawing operation after the quench may be done in a vertical

position, though more often in a horizontal position; in the former the same kind of furnace may be used for drawing as for quenching. The advantage of the vertical draw is that the piece is less likely to warp or bend when suspended vertically than when supported on blocks horizontally. In horizontal drawing, the "bung top" box furnace may be used, but the best practice is to use a car bottom with an over-fired or under-fired combustion chamber, the charge being virtually in a muffle, where accurate control of temperature may be maintained.

The advantage of the car bottom type lies principally in the ease with which the charge may be properly set. As the drawing temperature is of course below the critical temperature, theoretically the piece can be cooled quickly from the drawing temperature, but in ordnance work this practice should be avoided, because of strains that may be set up, which may show up in warping when the piece is being finished machined for assembly.

Both the quenching and drawing furnaces should be accurately controlled by the best pyrometer equipment obtainable, to determine whether the prescription has been correctly followed and to record the actual conditions during the heat.

Physical Testing

The specifications provide that tests for physical properties shall be made to determine whether the piece has the proper strength, ductility and toughness to meet the requirements of the designer. In gun forgings, as the greatest strains are those tending to burst or split the gun, the transverse or tangential bar is taken to determine the strength of the tube or hoop in this direction. These tests are taken from suitable prolongations provided at one or both ends, turned or ground to the proper size (American practice being 0.505 inches diameter by 2 inches between measuring points) and then broken in a tensile testing machine, and the tensile strength, elastic limit, percentage of elongation and percentage of reduction of area at point of fracture determined. The most common specifications in physical properties call for: Tensile strength, 95,000 pounds per square inch; elastic limit, 65,000 pounds per square inch; 18 per cent stretch and 30 per cent contraction; this being the requirement for nickel steel gun forgings for both our army and navy.

When the test bars are broken we know for the first time whether the ingot was properly made and whether the forging and the heat treatment were properly done. If the piece meets the test in all the bars required it is provisionally accepted, after which it is cut to length and sent to the machine shop for further machine work.

Chemical Specifications

The chemical requirements in American gun forgings are: Phosphorus and sulphur less than 0.05 per cent. Foreign specifications sometimes place limits on other elements, particularly copper, though copper in reasonable quantities say up to 0.25 per cent, has not been considered harmful in this country.

The chemical and physical requirements mentioned constitute the meat or heart of the American specifications, but there is one other important requirement that should be mentioned. This is the amount of reduction from the ingot to the forging. The specifications for gun forgings call for a reduction of area of 4 to 1 from the ingot to the forging; for instance, a 20-inch diameter forging requires a 40-inch diameter ingot or equivalent. This provision is subject to much criticism for the reason that large ingots are subject to difficulties. This is because steel expands when heated and contracts while cooling; and, further, because steel is a mixture of elements which in combination with iron have different melting or solidifying points. The larger the ingot the more difficult it is to secure a good ingot.

The decrease in quality of the ingot with respect to segregation is believed to be in the ratio of the square of its diameter, and whether this is correct or not, it is an indisputable fact that the difficulties increase greatly with the cross section of the ingot. Therefore, as small an ingot should be used as will insure a thorough working of the metal in the forging. Certainly a reduction of area of 2 to 1 from the ingot to the forging should be sufficient. An ingot is a casting, and a forging is better structurally than a casting; therefore, the ingot should be worked thoroughly to break up the bad ingot structure; but it is unwise to use an ingot of larger section than is absolutely necessary.

Forging Armor Plate

The purpose of armor is to prevent the bullet or shell or projectile from passing through it and thereby damaging men or machinery. The thin armor used for helmets, breast plates and gun shields, usually less than one-half inch thick, is intended to be proof against penetration of the rifle or machine gun bullet which is generally about 0.30-inch diameter and has a muzzle velocity of from 2500 to 3200 feet per second. The modern rifle bullet is steel jacketed and has tremendous penetrating powers, particularly at ranges up to 500 yards. The problem, therefore, to make a plate light enough for a man or a motor car to carry and still strong enough to withstand the bullet is an interesting and difficult one. For this purpose a very high grade steel is used, often of crucible or electric furnace manufacture, alloyed with nickel, chromium, molybdenum, tungsten, or all of them together. The properties of the steel must be extreme strength or hardness, and yet sufficient toughness and ductility to prevent fracture or shattering. A tool steel saw blade has hardness, but not sufficient toughness, and the alloys, together with careful heat treatment, give this toughness. This armor is the product of the rolling mill. After rolling it is annealed, then machined and bent to size and shape, then heat treated and tested ballistically, and after acceptance straightened or rectified cold. In this condition it is still usually soft enough to drill and tap or even bend, but will not flange or take sharp bends readily.

Heavy Armor

Armor for ships or fortresses, while intended to serve the same purpose as the thin shield, is a very different manufacturing problem. For ships the thickness will vary from four inches to 16 inches or 18 inches, but at the present time the greater part of the armor protecting battleships is about 13 inches thick; in width up to 10 feet, and in length up to 30 feet. Single plates weigh as much as 125,000 pounds.

To prevent penetration by the armor piercing projectile, it is necessary that the armor face be hard and strong, perfectly supported by a softer and tough back. Nickel and chromium in proper percentages are used, the rest of the composition being plain carbon steel with carbon 0.20 to 0.50 per cent depending on other conditions. In order to get the necessary hardness in the face it is customary to carbonize or cementize. Each maker has his own carefully worked out and carefully guarded formula for this delicate and important operation.

The ingots for armor plate are usually cast rectangular, with thickness to give sufficient forging reduction, and length and width to give the required weight and to suit the mechanical devices used in forging. They are cast in sand or iron molds and have, of course, sufficient riser, sinkhead or tonghold to insure neces-

sary solidity and freedom from piping. As they are made of nickel chrome steel and weigh 200,000 to 300,000 pounds each, they must be taken hot from the open hearth and charged in heating furnaces, which except for their great size are no different from other ingot heating furnaces described before.

A powerful hydraulic forging press of 10,000 to 15,000 tons capacity is used for forging. After forging, the various heat treating, bending and machining operations are carried out.

For purposes of test, armor is manufactured in groups of about 400 to 600 tons each, and after all the plates in a group have passed through all of the heat treating steps and are found to be uniform as far as can be determined by means of scleroscope, brinell, tensile test, and microstructure examinations, one of the plates is selected for ballistic test. If this test is successful the group is passed. After this, the remaining plates are machined to final size and sent to the shipyard. The difficulties encountered in the manufacture of case hardened gears for automobiles or power transmission machinery indicate how extremely difficult and hazardous it would be to carry out the necessary mechanical and metallurgical operations on a piece of metal weighing 150,000 pounds. The tool equipment for making armor is massive and powerful, but must be capable of delicate control, and ingenious auxiliary equipment is employed for handling.

For field and coast artillery and for naval rifles from 3 inches to 16 inches, the shell or projectile is quite a manufacturing problem, and there is much difference between an armor piercing shell and a high explosive shell, in the work it is to do, its physical and chemical properties, and the details of manufacture.

The high explosive shell is usually nothing more than a container or carrier for the high explosive itself, the gun and shell being used to place the high explosive where it is thought it will do the most good; it has no penetrating to do other than through light breast works. For greatest efficiency the high explosive shell has as large a cavity or containing capacity as is possible, with only the necessary strength of wall to stand the shock of being fired from a gun at high speed. Another important function of the high explosive shell is the damage done by the fragmentation of the shell body itself, and the shell is so designed with respect to thickness of wall and physical properties as to give the desired fragmentation.

Armor Piercing Shells

The armor piercing shell, on the other hand, while its mission in life is the same as that of the high explosive shell—namely, to cause a damaging explosion where it is desired—has the very difficult job of getting through a piece of armor designed and constructed to keep it out. Further, the armor piercing projectile must not explode its charge until after it gets through this armor plate. We have here a beautiful example of an irresistible force meeting an immovable object; the projectile to be successful must go through the plate, and the plate to be successful must keep the projectile out. This apparently hopeless situation is a great bone of contention between armor and projectile makers, and is particularly embarrassing where one company makes both armor and projectiles.

Armor piercing projectiles are made from crucible, electric furnace or open hearth, high-carbon alloy steel, forged under a press or steam hammer, much as an axle is forged. The machine work is simple, requiring principally medium size but powerful high duty turning and boring lathes and grinders for the bourrelet. The heat treating operations are, however, elaborate and complicated combinations of the three basic treatments spoken of before—annealing, quenching and drawing. For obvious reasons I shall not give further details regarding this step, but will say that the manufacture of large armor piercing shells to meet the present American specifications is the most difficult problem in the metallurgy of steel today. Only in recent years have one or two concerns been able to take it out of the laboratory and place it on a manufacturing basis where the tremendous modern requirements can be met.

The high explosive shell or shrapnel body is a comparatively simple metallurgical problem, and not an extremely difficult mechanical problem. For this purpose a simple carbon steel is generally used, though the physical specifications sometimes make it necessary that some heat treatment be done. The usual steps are as follows: Casting the ingot, any standard size and shape, say 30 inches square; blooming and rolling to the desired round; slicing into units or slugs of the proper weight; forging by punching and drawing on a bench; annealing (or quenching and drawing); and finally machining and assembling with base plug and fuse.

Possibilities in Montana Manganese Ore

MANGANESE is one of the materials whose value has been immensely augmented by the war. For this reason domestic deposits which previously were considered too poor for exploitation are now being studied with a view to their utilization. The United States geological survey has recently issued a bulletin setting forth the result of investigations carried on by J. T. Pardee in the Butte, Mont., region.

According to these investigations the amount of material in this district that is sufficiently rich in manganese to be considered a possible source of that metal is large. The smaller part of this which is found in the outcrops and upper parts of the lodes, consists of manganese oxides associated with more or less quartz. Only a little of this meets present trade requirements, however, by far the greater portion being comparatively low in manganese and high in silica. A reserve of not more than 2600 tons, as estimated, contains 40 per cent or more manganese, and but little more than one-third of this amount runs less than 10 per cent silica. In addition, however, fairly detailed estimates show totals of about 132,000 tons of material averaging 24 per cent manganese and 50 per cent silica and 270,000 tons averaging 11.5 per cent manganese and 73 per cent silica. Tests of the richer of these two grades so far reported by mining companies, though not wholly satisfactory, by no means discourage the hope that it can be profitably concentrated.

Rather curiously, manganese minerals are scarce in the veins that yield copper ore, and in fact are not found in those of the area surrounding Anaconda Hill which has been called the central copper zone. Outward from this zone manganese minerals appear, but they are not plentiful within the area that produces ores predominantly valuable for copper. Beyond this area on the north, west and southwest in a peripheral zone commonly known as the silver area, manganese minerals are plentiful in all the veins. Outward from this zone manganese is again generally less abundant, and the outer as well as the inner limit of the manga-

niferous zone is therefore rather indefinite.

Two main types of manganiferous ore are found in the Butte lodes—the black or oxide ore of the outcrops and the oxidized zone and the pink or carbonate and silicate ore that occurs below. Although differing in origin and occurrence the high-grade oxide ore at Butte is essentially similar to that produced in foreign countries and the eastern United States, upon which the industries have heretofore chiefly depended. The low-grade ore, which composes all but a small part of the deposits, differs, however, from the low-grade deposits, worked in Arkansas and other states east of the Rocky mountains in that the matrix of the manganese minerals is hard vein quartz instead of rather soft clay or a similar residual material.

Manganese carbonate is new to the trade in the United States, though it has been mined and utilized for a considerable time in Europe, and so far as is known, silicate ores have not yet been used as a source of manganese, except some mixed ores mined in the province of Huelva, Spain. In accordance with the trade customs that were most common in the northwestern states in 1917, the manganiferous material of the Butte lodes is somewhat arbitrarily subdivided into high and low grade, according to whether it contains more or less than 40 per cent of manganese and into high or low silica ores according to whether it contains more or less than 10 per cent of silica. The pink ore may be further classified as carbonate, silicate, or mixed carbonate and silicate.

By far the most of the material in the manganiferous lodes is highly siliceous and contains less than 40 per cent of manganese. Iron is present in small amounts only—generally less than three or four per cent. Therefore the classification of material containing as little as 5 per cent as a manganiferous ore, which is possible with some iron ores because they can be smelted directly to manganese-iron alloys, can not be applied unqualifiedly to the Butte deposits. Owing to the more complicated metallurgic treatment required for these deposits, the amount of manganese necessary to permit definition of the material as ore is presumably considerably more than 5 per cent. In August, 1917, the operators who were experimentally concentrating the oxide ores considered tentatively that the smallest amount of manganese permissible in the raw ore was about 20 per cent, and that figure was therefore adopted to define one of the grades of ore estimated in the field. Considered as having a possible future value, material containing from 10 to 20 per cent of manganese was also estimated as a separate grade.

With reference to their probable adaptability to mechanical concentration, the low-grade oxide ores may be broadly classified into two groups—coarse textured ores, in which the manganese oxides and the quartz occur in somewhat distinct masses, rather easily separable from each other, and jaspery ores, in which the constituents are closely associated and form a strongly coherent mass. Fortunately the great bulk of the ore reserves as estimated come under the first of these groups.

The pink or unoxidized manganiferous material of the Butte lodes had not, up to October, 1917, when the investigations were finished, been utilized in the United States, and its designation as ore is therefore somewhat uncertain. Rhodochrosite, however, which, as found in the Emma mine, forms bodies that contain about 40 per cent of manganese and little silica and presumably offer slight metallurgic difficulties to their utilization, is without doubt a valuable ore. The probability that large amounts of ore of this kind exist at Butte is indeed the most promising feature of the known manganiferous deposits.

Pure rhodonite, which may also form considerable bodies at Butte, is possibly to be classified as a high-grade silicate ore. It differs from the high-grade siliceous ore of the oxidized zone in that its silica is chemically combined instead of free. The great bulk of the deposits below the oxidized zone, however, are composed of rhodochrosite, rhodonite, and free quartz in various proportions and contain less than 40 per cent of manganese. They are arbitrarily classed as low-grade carbonate and low-grade mixed carbonate and silicate ores, the lower limit of manganese for each being assumed at 15 per cent.

Future of the Japanese Steel Industry

BY J. P. SUZUKI

ALONG with the development of various lines of her manufacturing industry, particularly shipbuilding, considerable demands for iron and steel have sprung up in Japan during the past few years. Japan has never had such great demands before, and there are many indications which justify the statement that these demands will go on increasing instead of diminishing as time goes by. In consideration of this there are many influential Japanese merchants and businessmen who contemplate undertaking the steel industry, their idea being to realize what they have always aspired to attain,—namely a state of self-supply in the matter of iron and steel. Needless to say, the American embargo on the export of iron and steel has awakened the Japanese to the necessity of self-supply so as to meet the domestic requirements. As a matter of fact, the official negotiations between Japan and the United States regarding the matter have recently found a solution, which, it must be admitted, is highly satisfactory under existing conditions, yet Japan is anxious to pursue the so-called policy of self-supply in order that she may not be placed again in the same awkward position as when America prohibited the export of iron and steel. It is interesting, therefore, to consider what possibilities there are for Japan to build up the steel industry to a point of self-supply.

It is said that there are about 60,000,000 tons of iron ore in Japan proper, while Chosen possesses some 50,000,000 tons, making a total of 110,000,000 tons. This is of course a rough estimate, and, as there is at present the so-called mining mania, particularly in Chosen, it is not difficult to believe that some more new mines will be discovered in the future, in which case the amount of iron ore will be more than the estimate mentioned above.

As regards coal, which is important for the promotion and maintenance of the steel industry, Japan can produce 8,000,000,000 tons yet. This is, however, the maximum amount she can yield. Next, the total amount of hydroelectric power in Japan is estimated at about 5,000,000 horsepower, but there is every prospect of making it more, if necessary.

The aforementioned facts show that the insufficient amount of iron ore is a great drawback to the steel industry in Japan. While it is possible that Japan can turn out iron and steel sufficient to meet her domestic requirements for a certain period of time, it is doubtful that she will be able to maintain a state of self-supply permanently. Japan needs annually about 1,300,000 tons of steel. As such is the case, the aforementioned

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amount of iron ore which Japan is supposed to possess will yield iron and steel for some 36 years, provided that the rate at which Japan consumes it remains the same as it is now. But it is difficult to think that the demands for iron and steel will remain the same as they are now. On the contrary, that they will increase hereafter seems certain. It is quite possible that in a few years Japan will require from 2,000,000 to 3,000,000 tons of steel per annum.

Considered from this point, the life of the steel industry in Japan will not last more than 30 years. As to the consumption of coal, Japan consumes some 10,000,000 tons per annum. And if the steel industry develops, then the amount of consumption will greatly increase. It may be worth mentioning in this connection that the amount of coal consumption has increased 19 per cent during the last 10 years, and if it increases at this rate, Japanese coal will be exhausted in half a century after this. Now, about 4 tons of coal are required to produce 1 ton of steel, so that the rise of the steel industry will aggravate the present amount of coal consumption. Thus it will be seen that the insufficiency of iron ore and coal makes it impossible for Japan to realize a state of self-supply. However, this view is dismissed by those who consider the matter from an optimistic standpoint, according to which, hydro-electric power can take the place of coal, and as Japan has 5,000,000 horsepower of electricity, it can easily produce 6,000,000 tons of pig iron by using 2,000,000 horsepower and turning out 3 tons of steel per horsepower. It is easy to say this, but it is in reality impracticable. For to turn out 5,000,000 tons of steel, 12,000,000 tons of iron ore would be required per annum. Of course it may not be necessary for Japan to produce such a large quantity for immediate needs, but then the ore which Japan possesses being limited in quantity, it will be exhausted ere long.

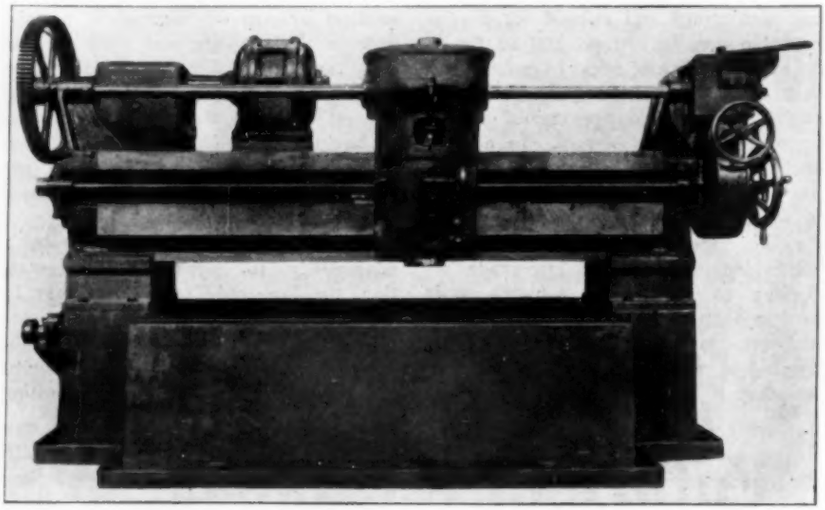
Plate Scarf Miller

The milling machine which is shown in the accompanying illustration was recently designed by the Newton Machine Tool Works, Inc., Philadelphia, for the purpose of milling scarfs on ship deck plates. The machine is of massive construction throughout and is designed to insure maximum production.

The top surface of the base forms the work table or platen of the machine. The space between the uprights is 9 feet 2 inches x 4 feet 9 inches. Parallel T-slots for the accommodation of clamping bolts are cut the entire length of the table. Also many reamed holes are provided for locating stops to take the side thrust of the cut. Aligning slots are cut at right angles with the T-slots. This feature permits the location of the work in a convenient position.

The cross rail is of the self-contained type. The spindle is 5 inches in diameter and has a vertical hand adjustment of 10 inches. The maximum distance from the top of the platen to the spindle nose is 10 inches and the length of feed available for the head traveling along the cross rail is 9 feet. The spindle is driven through the medium of a worm and worm wheel. The latter is equipped with a bronze ring on which the teeth are cut. These are of steep lead. The driving worm is hardened to insure it against reasonable wear and is equipped with roller thrust bearings. The worm and worm wheel are oiled by means of continuous lubrication.

The machine is driven by a 25-horsepower motor mounted on the rear of the upright. The power is transmitted to the spindle of the machine through the medium of spur gearing. A speed box is provided which gives six changes of speed. The speed-box gearing is mounted on sliding sleeves which are actuated by latch levers. The motion for the feed is taken from the right-hand side of the crossrail and is available in both directions by means of a clutched double train of bevel gears. As the bevels on ship deck plates vary as regards the angle, it is necessary to provide means for milling different angles. This is accomplished in this case by providing separate sets of uprights which are mounted between the crossrail and the base. Each pair of uprights is made of a suitable angle to accommodate a certain angle of scarf. The uprights are provided with aligning slots and keys to insure proper location when changes from one set of uprights to another are made. To insure cool cutting the machine is equipped with a reservoir for cutting oil and a delivery pump.



NEWLY DESIGNED MASSIVE PLATE SCARF MILLER

By-Product Coke Gaining

A steadily enlarging proportion of the coke produced in the United States, exclusive of that produced in gas-houses, is from the by-product ovens, according to a discussion presented at the spring meeting of the American Society of Mechanical Engineers at Worcester, Mass., June 4-7, 1918, C. E. Lesher of the U. S. geological survey, Washington. In 1910, according to Mr. Lesher's figures, only 17.1 per cent of the production was from by-product ovens, while in 1917 it is estimated that 40 per cent of the supply was from these plants. The proportion of by-product oven coke to the total in 1911 was 22.1 per cent, in 1912, 25.3 per cent, in 1913, 27.5 per cent, in 1914, 32.5 per cent, in 1915, 33.8 per cent and in 1916, 35.0 per cent.

The development of the by-product industry in the United States up to the close of 1914, Mr. Lesher says was largely the result of the recognition by iron and steel companies of the economies possible by the recovery of by-products and of the flexibility of operation, as well as the assurance of a regular and continual supply of suitable blast-furnace fuel.

All new by-product plants will continue to be operated after the demand for coke—now abnormal—decreases, with the result that the percentage of by-product coke to the total output in the United States will continue steadily to increase even after the war.

Steel Exports Continue to Decline

June Tonnage Smallest Since July 1917—Semifinished Material Shows Marked Shrinkage—Pig Iron Shipments Droop—Bar Iron and Structural Only Products to be Increased—Imports About Staple

WITH the exception of March, the tonnage of iron and steel exports for June was the smallest for any month since July, 1917. The report of the bureau of foreign and domestic commerce shows shipments of 418,605 tons for June, a loss of 69,910 tons compared with the previous month's total of 488,515 tons, and 210,700 tons below the figure for June, 1917. For the 12-month period ending June, 1918, 5,712,931 tons of iron and steel commodities were shipped out of this country. This is a loss of 1,161,153 tons compared with a similar period in 1917, when the total tonnage was 6,874,084, but compared with 1916, with a total of 4,843,273 tons, it is a gain of 869,658 over the previous year.

The most marked decline of the month was shown in semifinished material with shipments of 139,377 tons, which indicates a falling off of 19,922 tons from May with a movement of 159,299 tons and is 51,530 tons less than the June, 1917, total of 190,907 tons. Steel rail shipments also registered a decided loss. June exports amounted to only 25,069 tons, compared with 42,078 tons in May, a loss of 17,090 tons, or a little more than 40 per cent. Compared with June a year ago, when shipments totaled 41,237 tons, the loss was 16,168 tons, which is approximately the same percentage. Other products in which a decided decrease in tonnage is noted are steel bars and pipes and fittings. Steel bar exports amounted to 33,581 tons in June, compared with 48,970 tons in May and 52,257 tons in June a year ago, losses of 15,389 tons and 18,676 tons, respectively. Pipes and fittings fell from 17,608 tons in May, to 11,658 tons in June.

Little Change Shown

A comparison of May and June exports of the other iron and steel products shows very little change. June, 1918, shipments of pig iron, however, were only 22,896 tons, or about one-fourth of the total of 83,406 tons for June, 1917; while scrap declined from 9737 tons a year ago to 318 tons in June of this year. The only products showing a decided increase in June over May were iron bars and structural iron and steel.

For the past several months there has been very little change in the tonnage of iron and steel products shipped into the United States. June imports amounted to 13,913 tons, or only 474 tons below the May total of 14,387 tons. For June a year ago, however, the imports were 29,080 tons, or more than twice the tonnage for June, 1918. Pig iron imports increased from 4238 tons in May to 5885 tons in June, but were not as great as the total for June a year ago of 6484 tons. The steel rail tonnage for June amounted to 400, while in May the bureau reported no rails were received from foreign countries. The total imports for the 12 months ending June, 1918, 201,713 tons, are only about half the total of 401,662 tons for a similar period in 1917.

IMPORTS AND EXPORTS, GROSS TONS

1915	Imports	Exports
July	20,858	380,340
August	27,556	405,949
September	23,345	382,113
October	34,318	349,843
November	37,131	362,764
December	35,408	353,853
1916		
January	15,824	360,102
February	20,279	368,980
March	15,159	438,649
April	20,176	384,452
May	32,114	538,657
June	26,885	515,214
July	14,774	502,330
August	23,255	571,401
September	25,559	643,762
October	30,169	588,892
November	42,545	554,219
December	44,134	580,988
1917		
January	40,910	608,281
February	24,947	449,099
March	37,943	606,559
April	48,213	519,397
May	26,479	582,303
June	29,080	629,305
July	28,859	357,776
August	22,635	519,518
September	20,196	482,311
October	14,225	557,138
November	13,995	473,549
December	13,769	654,867
1918		
January	12,875	495,057
February	12,941	438,848
March	14,345	379,924
April	11,371	462,887
May	14,387	488,515
June	13,913	418,605

IRON AND STEEL IMPORTS

	June, 1918	June, 1917	Twelve months ending June, 1918	Twelve months ending June, 1917
Pig iron	5,885	6,484	54,776	118,251
Scrap	3,163	15,598	66,207	223,834
Bar iron	236	142	2,596	4,383
Ingots, blooms & billets	2,317	4,698	45,643	28,015
Structural shapes	154	95	7,280	1,021
Rails	400	970	8,385	14,067
Sh. and plates	53	139	2,098	1,665
Tin and terne plate	.....	2	32	612
Tin scrap	397	931	7,914	7,729
Wire rods	1,308	21	6,782	2,085
Total	13,913	29,080	201,713	401,662

IRON AND STEEL EXPORTS, GROSS TONS

	June, 1918	June, 1917	Twelve months ending June, 1918	Twelve months ending June, 1917
Scrap	318	9,737	22,385	238,666
Pig iron	22,896	83,406	377,012	834,930
Steel billets, ingots and blooms	139,377	190,907	1,970,831	1,935,026
Wire rods	8,234	17,094	186,579	147,223
Steel rails	25,069	41,237	430,347	594,389
Steel bars	33,581	52,257	612,720	749,966
Iron bars	5,214	5,951	50,240	64,681
Struc. iron and steel	17,885	19,512	240,961	339,486
Hoops, bands and scroll	3,709	5,845	58,781	48,058
Sh'ts & plates	75,270	96,896	791,622	692,425
Tin and terne plate	30,557	25,460	251,365	232,969
Barbed wire	22,922	17,368	185,942	303,232
All oth. wire	11,381	21,888	168,547	242,113
Cut nails	515	359	5,196	4,605
Wire nails	5,470	9,846	108,930	124,702
All oth. nails incl. tacks	1,023	2,578	13,139	19,544
Pipes & fit'gs.	11,658	22,617	180,786	244,362
R. R. spikes	1,049	2,278	15,550	19,112
Bolts, nuts, rivets and washers	2,067	2,799	30,155	29,530
Horseshoes	160	255	9,001	4,279
Cast radiators	250	1,015	2,842	4,786
Total	418,605	629,305	5,712,931	6,874,084

EXPORTS, GROSS TONS

1916	Pig iron	Semi-finished material
Jan.	19,319	55,315
Feb.	15,061	87,406
Mar.	19,439	107,674
Apr.	18,518	88,764
May	28,293	142,782
June	48,770	116,316
July	28,718	135,827
Aug.	60,264	160,921
Sep.	64,122	163,104
Oct.	92,756	162,669
Nov.	106,781	120,883
Dec.	105,195	162,901
1917		
Jan.	69,146	183,656
Feb.	49,018	131,566
Mar.	69,629	193,469
Apr.	44,783	162,209
May	61,112	168,158
June	83,406	190,907
July	32,368	112,085
Aug.	62,083	189,083
Sep.	44,287	148,932
Oct.	47,200	204,724
Nov.	25,733	150,120
Dec.	66,573	204,555
1918		
Jan.	20,581	195,385
Feb.	10,540	173,272
Mar.	9,849	144,443
Apr.	11,282	177,128
May	22,567	159,299
June	22,896	139,377

IRON ORE IMPORTS, GROSS TONS

	June, 1918	June, 1917	Twelve months ending June, 1918	Twelve months ending June, 1917
Spain	.....	30	26,093	216,046
Sweden	.....	17,015	17,718	147,610
Canada	16,360	12,388	186,476	113,127
Cuba	42,465	25,413	605,625	613,308
Oth. countries	.....	.....	1,634	60,995
Total	58,825	54,846	837,546	1,151,086

Average Analyses of Iron Ores from Lake Superior District

In working out these tables, ores containing not more than 0.001 of 1 per cent of phosphorus to each unit of iron in the natural condition were classed as bessemer.

Bessemer Ores

Gogebic Range

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	2,940,287	53.6999	0.04156	40.7
1916	3,933,594	53.7979	0.04119	48.3
1915	2,453,589	54.2023	0.04002	47.7
1914	2,067,627	54.4771	0.03947	59.9
1910	3,183,563	54.1441	0.04122	80.0
1905	3,154,126	54.7369	0.04093	90.2
1902	2,796,545	55.7324	0.04184	87.5

Marquette Range

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	781,952	52.8340	0.03830	18.4
1916	690,283	54.8985	0.03709	14.4
1915	574,704	55.1585	0.03932	16.2
1914	380,484	53.9746	0.03782	18.5
1910	995,392	55.0838	0.04490	25.5
1905	1,059,980	57.5585	0.04616	27.1
1902	1,054,757	58.2631	0.04239	29.9

Menominee Range

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	461,013	51.9900	0.04460	8.9
1916	177,979	53.0572	0.04019	3.4
1915	126,507	55.1999	0.03522	3.2
1914	59,380	56.9574	0.02609	2.5
1910	185,775	53.6310	0.04323	5.0
1905	160,727	56.8037	0.03197	4.6
1902	86,018	57.7141	0.01674	2.8

Vermillion Range

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	1,109,688	58.0603	0.03950	74.8
1916	1,466,702	57.6797	0.04048	76.1
1915	1,391,816	57.9406	0.03870	81.6
1914	741,224	58.4818	0.03919	73.8
1910	933,147	60.1133	0.03745	78.2
1905	1,413,007	60.6082	0.03857	85.7
1902	1,639,108	61.5522	0.03983	80.1

Cuyuna Range

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	127,106	54.193	0.0423	6.8
1916	68,867	53.23	0.044	5.8

Total Old Range

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	5,420,046	54.3338	0.04090	27.1
1916	6,337,425	54.7892	0.04059	29.8
1915	4,546,616	55.4953	0.03939	29.9
1914	3,248,715	55.3773	0.03897	33.6
1910	5,297,877	55.3540	0.04132	41.5
1905	5,787,840	56.7445	0.04106	46.3
1902	5,576,428	57.9523	0.04097	47.4

Mesabi Range

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	15,681,296	52.9391	0.04383	38.3
1916	15,605,590	53.0936	0.04565	37.1
1915	10,471,532	52.8959	0.04348	35.9
1914	8,075,955	52.5751	0.04512	38.8
1910	13,164,962	53.3587	0.04608	46.3
1905	13,914,139	55.3543	0.04215	70.1
1902	10,618,878	56.6690	0.03948	80.6

Total Bessemer

Year	Tonnage	Average iron (natural)	Average phosphorus	Per cent of bessemer
1917	21,101,342	53.2973	0.04390	34.7
1916	21,943,015	53.5848	0.04419	34.6
1915	15,018,148	53.6829	0.04224	33.8
1914	11,324,670	53.3789	0.04335	37.2
1910	18,462,839	53.9313	0.04472	44.8
1905	19,701,979	55.7627	0.04183	60.9
1902	16,195,306	57.1109	0.03995	64.9

Nonbessemer Ores

Gogebic Range

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	4,278,579	52.7252	0.08654
1916	4,206,702	53.0255	0.08454
1915	2,690,524	53.8477	.....
1914	1,387,006	53.5142	.....
1910	793,953	52.5195	.....
1905	339,972	52.1136	.....
1902	397,726	53.7872	.....

Marquette Range

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	3,463,633	52.2738	0.1606
1916	4,103,426	52.4393	0.14709
1915	2,975,180	53.6162	.....
1914	1,676,825	53.0141	.....
1910	2,904,774	52.7952	.....
1905	2,853,024	54.3907	.....
1902	2,464,187	55.1032	.....

Menominee Range

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	4,730,157	51.3974	0.3573
1916	5,075,912	51.6237	0.33905
1915	3,778,585	51.6456	.....
1914	2,360,684	51.5970	.....
1910	3,489,460	51.0734	.....
1905	3,290,402	52.8159	.....
1902	2,919,762	54.1020	.....

Vermillion Range

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	373,260	57.8935	0.1004
1916	459,630	58.8053	0.09884
1915	312,973	58.3877	.....
1914	262,946	58.7976	.....
1910	259,268	60.2483	.....
1905	235,603	64.3330	.....
1902	406,784	61.9984	.....

Cuyuna Range

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	1,727,935	50.1840	0.2104
1916	1,109,484	50.3779	0.19058
1915	897,782	50.0573	.....
1914	736,573	50.0926	.....

Total Old Range

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	14,573,564	52.0148	0.2071
1916	14,955,154	52.3701	0.19478
1915	10,655,044	52.8161	.....
1914	6,424,034	52.5031	.....
1910	7,447,455	52.2185	.....
1905	6,719,001	53.8529	.....
1902	6,188,459	54.9995	.....

Mesabi Range

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	25,217,804	50.1979	0.07856
1916	26,432,396	49.1925	0.7715
1915	18,718,088	49.5407	.....
1914	12,726,990	49.5887	.....
1910	15,261,849	49.7468	.....
1905	5,932,495	51.6239	.....
1902	2,546,936	53.5531	.....

Total Nonbessemer

Year	Tonnage	Average iron (natural)	Average phosphorus
1917	39,791,368	50.8633	0.1256
1916	41,387,550	50.3407	0.11887
1915	29,373,132	50.7288	.....
1914	19,151,024	50.5663	.....
1910	22,709,304	50.5574	.....
1905	12,651,496	52.8077	.....
1902	8,737,395	54.5778	.....

Iron Content

Of Lake Superior Ores Unchanged Despite Heavy Shipments

Lake Superior iron ores continue to maintain their quallity despite the heavy inroads on the supply made in the past few years. Although more than 80,000,000 tons of nonbessemer ore has been shipped from Lake Superior district in the past two years, the average iron content, natural, in 1917, was the highest since 1908. Bessemer ores, of which 43,000,000 tons have been shipped in the past two years, fell off slightly in average iron content, natural, last year, the analyses being the lowest on record but only slightly less than has been shown annually since 1908.

The Lake Superior Iron Ore association, Clevealnd, has just published the complete figures showing the average of analyses of Lake Superior iron ores. In 1917, the nonbessemer ores had an average analysis of 50.8633 against 50,3407 in 1916. In 1902, the first year for which records are available, the analysis was 54,5778. The average phosphorus content in 1917 was 0.1256 against 0.11887 in 1916. By ranges the average iron content, natural, was as follows: Gogebic, 52,7252 against 53.0255 in 1916; Marquette, 52.2738 against 52.4393 in 1916; Menominee, 51.3974 against 51.6237 in 1916; Vermillion, 57.8935 against 58.8053 in 1916; Cuyuna, 50.1840 against 50.3779 in 1916; Mesabi, 50.1979 against 49.1925 in 1916. For the old ranges, the analysis dropped to 52.0148 in 1917 from 52.3701 in 1917.

For bessemer ores, the analysis by ranges was Gogebic, 53.6999 againist 53.7979 in 1916; Marquette, 52.8340 against 54.8985 in 1916; Menominee, 51.9900 against 53.0572 in 1916; Vermillion, 58,0603 against 57.6797 in 1916; Cuyuna, 54.193 against 53.23 in 1916; Mesabi, 52.9391 against 53.0956 in 1916. For the old ranges the analysis dropped to 54.3338 in 1917 from 54.7892 in 1916.

The Austin Co., Cleveland, has opened a branch office in Chicago at 437 Peoples Gas building, to give closer attention to business from the Middle West.

Electric Welding

In Steel Shipbuilding is Covered by Series of Papers

The general subject of electric welding as applied to steel ship construction was very thoroughly covered in a series of discussions held in Philadelphia during the past six weeks, for the benefit of Delaware river shipbuilders. The meetings were arranged and conducted under the auspices of the education and training section of the Emergency Fleet corporation, of which Louis E. Reber is director, E. E. MacNary, superintendent of training, and H. A. Hornor, head of the electric welding branch. The lectures were given by members of the electric welding committee of the Emergency Fleet corporation. A similar series of talks is now being arranged for shipbuilders in the Great Lakes district.

Naval Constructor H. G. Knox of the Norfolk navy yard inaugurated the Philadelphia program June 26 with a paper entitled "The Language of Electric Welding." Mr. Knox detailed the proper nomenclature, the symbols and the various types of welding as recently approved by the electric welding committee of the Emergency Fleet corporation. He discussed the best preparation of materials for making welded joints and disclosed recent experiments which were undertaken to establish the corrosive action of salt water on the electrically welded joint.

The second meeting, which was held June 10, was addressed by W. L. Merrill of the power and mining department of the General Electric Co. on "Tools for Electric Welding." This paper detailed extensive experiments in spot welding recently conducted by Mr. Merrill, and set forth much data regarding the proper apparatus for use in electric arc welding. He recounted the development of apparatus for electric welding purposes that has occurred in the last three months, and discussed economical methods of installation.

J. H. Anderton, of the American International Shipbuilding Corp., July 17 submitted a paper entitled "Time Saving in Steel Ship Construction." Mr. Anderton recounted the results of investigation which were undertaken to show what and how many jobs may be performed with the electric arc and spot welding machines, and he described numerous short-cut methods which had been developed as a result of these investigations.

E. J. Rigby, vice president of the Quasi-Arc Weldtrode Co., New York, on July 24 read a paper entitled "The Boiling Rod." This paper detailed the writer's long experience with the use of metal electrodes and it explained how the process is best adopted in successfully making long welded seams, such as are encountered in shipbuilding.

"Present and Future Status of Electric Welding in Ship Construction and Repair," was the title of a paper submitted July 31 by Naval Constructor S. V. Goodall of the British admiralty. This paper described the extent of electric welding in Great Britain, and pointed out the advantages to be gained by its use in the damaged parts of present riveted vessels, as well as in new construction.

Prof. Comfort A. Adams, chairman of the electric welding committee and president of the American Institute of Electrical Engineers, closed the series on Aug. 7 with a paper entitled "Anthology of the Art." Prof. Adams explained the organization and work of the electric welding committee and summed up the results that are now available of the work of this committee.

Old Range Manganese, Low Grade and Silicious

Year	Tonnage	Average iron (natural)
1917	1,723,335	39.8783
1916	2,075,110	42.2555
1915	1,463,311	43.7797
1914	976,865	41.2884
1910	890,339	40.9814
1905	1,380,414	42.3812
1902	1,846,400	44.1636

Average Analyses of Iron Ores from Lake Superior District

Total Old Range

Year	Tonnage	Average iron (natural)
1917	19,993,610	52.6434
1916	23,367,689	52.1280
1915	16,664,971	52.7536
1914	10,649,614	52.3512
1910	13,635,671	52.7030
1905	13,887,255	53.9177
1902	13,611,287	54.7393

Total Mesabi

Year	Tonnage	Average iron (natural)
1917	40,899,100	51.2489
1916	42,037,986	50.6415
1915	29,189,620	50.7443
1914	20,802,945	50.7480
1910	28,426,811	51.4195
1905	19,846,634	54.2392
1902	13,165,814	56.0663

Grand Total All Ranges

Year	Tonnage	Average iron (natural)
1917	62,616,045	51.3812
1916	65,405,675	51.1726
1915	45,854,591	51.4746
1914	31,452,559	51.2908
1910	42,062,482	51.8356
1905	33,733,889	54.1069
1902	26,777,101	55.3917

Auto Builders Must Get War Work

Pleasure Car Industry Informed by War Industries Board Steel and Other Necessary Supplies Cannot be Obtained—Sworn Statements of Material in Stock Still Awaited and Will be Basis of Distribution

WASHINGTON, Aug. 13.—Steel manufacturers, machine and tool builders and other producers of supplies used in the manufacture of passenger automobiles, after Jan. 1, 1919 may look only to direct and indirect war markets for disposition of their materials. The pleasure car business as such is to go out of business not later than the first of the year, the war industries board has determined, and the industry has been notified to this effect. By giving this particular branch of the motor car manufacturing industry nearly five months in which to complete production of such orders in hand as may be filled from limited supplies of materials, the board feels it is providing ample time for conversion of the plants to essential war production.

The industries board's decision was made through a special committee and disclosed in an open letter to the National Automobile Chamber of Commerce. The automobile men, through Hugh Chalmers, had presented resolutions adopted by the chamber in which it was stated they voluntarily agreed to curtail production 50 per cent. The board's committee felt this was not sufficient, however, and even declined to meet the tentative proposition of Fuel Administrator Garfield who was to allow approximately 25 per cent of 1917's fuel supply to the pleasure car builders. Under the agreement between Dr. Garfield and Chairman Baruch of the war industries board, the fuel administration now is to follow the board's action and to refuse to provide fuel to the industry.

Builders are Disappointed

That the decision has met with a bitter reception on the part of the builders goes without saying, as the automobile men have tried by every means to have their business placed on a war footing. The only way this can now be done it is pointed out is for them to engage in some other line of production essential to the war program. This may be motor trucks, airplanes, engines, tools, munitions, or any other product for which this plant might be adapted and for which there is a direct or indirect war demand.

Little sympathy is held out to pleasure car manufacturers by the government, however, and steel men who have numbered them among their best customers now will have to turn this particular class of material to some more essential use. The government feels it has warned most nonwar industries, especially the passenger automobile and those serving them, that radical steps in curtailment would come. This time has now arrived and the materials entering into pleasure motors are to be held up until the automobile men have reported under sworn statements the amounts of raw materials on hand July 16. After Jan. 1 material shipments will be held up entirely, unless there is a sharp decline in the government's own demand for steel, rubber, labor, etc., which is deemed very improbable.

Subcommittee Settles Matter

The subcommittee which held the fate of the passenger automobile men in its hand was composed of Alex Legge, chief of the requirements division of the war industries board; Edwin B. Parker, priorities commissioner; J. Leonard Replogle, steel director; George N. Peek, chief of the finished products division, and C. C. Hanch, chief of the automotive products section. This committee was named one week ago today with full power to act and after hearing the automobile men, addressed the following letter to the national chamber:

We are in receipt of and have given very careful consideration to your communication of Aug. 8 embodying the resolutions passed at your meeting at Detroit, Tuesday, Aug. 6. We note that the manufacturers have voluntarily agreed among themselves to curtail the production of passenger cars 50 per cent. While this is clearly a step in the right direction and furnishes a basis for each and all of the manufacturers, without further delay, to make appropriate reductions in selling, general and overhead expenses, still it is only a step and further curtailment is inevitable.

Fairness to your industry impels us to state frankly that the situation as it is presented to us today indicates very clearly that there will be little, if any, of the principal materials required in the construction of passenger cars available for nonwar industries after the war requirements shall have been provided for, and the war industries board cannot at this time make any promise whatsoever regarding the supply to your industry of steel, rubber or other materials for any definite period in advance. We strongly believe that it is to the best interest of your members and all other manufacturers of passenger automobiles to undertake to get on 100 per cent war work as rapidly as possible and not later than Jan. 1, 1919, for in no other way can you be sure of the continuance of your industry and the preservation of your organization.

We regret that we are not in a position at this time to give you a more definite reply to your communication of the 8th instant due to the fact that the data and information which on July 16 we requested you to promptly furnish us has not yet been received. As soon as received prompt and appropriate action will be taken, of which you will be immediately advised.

No material will be furnished to any passenger automobile manufacturer until it has filed with this board a sworn statement embodying the information requested on July 16 coupled with an agreement to furnish this board with such additional information from time to time as it may require.

Receipt of the sworn statement asked for by the board likely will be followed by a redistribution of the raw materials on hand at the various passenger automobile plants so that all will be placed on an equal footing. If there is an abundance of a given material, steel for example, it is likely some of this will be commandeered and assigned to plants engaged in war production. Makers in all probability will be given opportunity to convert inventories into cash but not unless the information called for is forthcoming.

About the only way in which pleasure car manufacturing plants may continue in this line of production it is declared, will be to meet the requirements of the government and allies for passenger automobiles for official business and the demand of foreign governments in settlement of trade balances. For example, if Brazil, in return for the manganese, coffee and other materials which the United States, England or any of the allies get from her, should want shipments of pleasure cars, it is more than likely the war trade board will sanction the manufacture of such machines and the raw materials going into them will be supplied as for indirect war account.

As to the manufacture of motor trucks, which is not affected by the

decision of the war industries board, Priorities Commissioner Parker has sent out a circular which says the motor truck industry is regarded as direct and indirect war essential and that priority assistance for fuel and raw materials will be given upon conditions outlined in the following pledge to be given by truck builders and truck dealers:

The undersigned hereby pledges itself (1) to use only in the manufacture of motor trucks or repair parts for motor trucks the steel suitable therefore which is now in its possession or which may hereafter come into its possession; (2) to sell no motor trucks of its manufacture except (a) for essential uses as that term has been or may be defined or applied by the priorities division of the war industries board, or (b) under permits in writing, signed by or under authority of such priorities division; (3) to sell no user an unnecessary number of motor trucks even for essential uses; (4) to discourage the purchase of any motor truck to replace a usable truck already in service and to give maximum encouragement to the repair of trucks; (5) that this pledge shall bind not only the undersigned but also its branch houses; subsidiaries, dealers, brokers, factors, commission merchants and all other selling agencies; (6) to make no delivery of any motor truck to any one for resale, either directly or indirectly, until such one has filed with the undersigned its pledge of co-operation in writing; and to make monthly reports as required by the war industries board to the automotive products section of said board or otherwise as said board may direct.

Allied Experts Weigh War Problems

Important London Conference Now in Session Plans to Co-ordinate and Improve Present Methods of Distribution of Materials and Buying Competition— To Exchange Information and to Increase Shipping Efficiency

WASHINGTON, Aug. 13.—Co-ordination of war efforts to the superlative degree is the object of the gathering in London of technical advisors and experts of the various nations at war with Germany. This gathering may result in the "inter-allied pool" of which there has been more or less discussion and many rumors during the past few months. Arrival of the American contingent of industrial experts now makes permissible a statement of the character of the meeting and the personnel with which is intrusted the interests of the United States.

In the words of the war industries board "the purpose of their trip abroad is to confer with representatives of the allied nations in various inter-allied organizations, one of which is the inter-allied munitions council. The object of these conferences is to discuss the most effective methods of distribution of materials which all the allied nations require, the prevention of price inflation through unnecessary competition, conference with the maritime council in the saving of shipping space and the shortening of ship haulage, and the interchange of information concerning the supplies and requirements of the various countries."

The American delegation, that is, those from the war industries board, consists of 11 persons under the leadership of L. L. Summers, member of the board, its technical adviser and until a short time ago the chief of the chemicals and explosives division of the board. With Mr. Summers are Paul Mackall, of the Bethlehem Steel Corp., chief of the rail, alloy steel and projectile bar section of the steel division; George M. Armsby, chief of the tin section; John Hughes, assistant to President Farrell of the United States Steel Corp. and chairman of the American Iron and Steel institute's subcommittee on pig iron; Lincoln Hutchinson, assistant chief of the tin section, also representing other mineral sections; Edward A. Pierce, formerly of the raw materials division; Albert M. Patterson, chief of the foreign wool section; Frederick K. Nixon, assistant to Mr. Patterson; Chandler P. Anderson, counsel for the board in foreign affairs; Arthur D. Whiteside, statistician; Henry W. Boyd, of the leather section, and Philo B. Galt, Hubert H. Brooker and James B. Mahoney, secretaries to the delegation.

Already in Europe are E. N. Stettinius, second assistant secretary of war; Franklin D. Roosevelt, assistant secretary of the navy; Oscar T. Crosby, assistant secretary of the treasury, and various other government officials. With nearly 1,500,000 American soldiers in France, with a considerable part of the naval operations being directed from the other side, and with the numerous interests being built up by this country "over there," it is evident more of the activities of the United States will be based upon information obtained from this foreign department.

This is not taken to mean that the allied buying in this country will be directed from overseas. Foreign missions already in this country, working through their own clearing committee, then through the allied purchasing commission of the war industries board and finally through the treasury of the United States, this latter on purchases from American loans, will continue to do the buying for their respective governments. The "inter-allied pool" is to be more of an international clearing house for all war requirements. It will have little if anything to do with production. This will be continued through the war industries board here. The real purposes of the meeting in London is as set out in the words of the board, in the second paragraph of this article.

This organization is intended to stop any leaks of materials through unnecessary duplication of orders. It is to be operated somewhat upon the lines under which Marshal Foch is directing the movements of the allied armies. It is another step in centralization and co-ordination, two factors which early in the past winter characterized nearly every move made by the United States government. This principle is to be developed to the highest possible degree to get the "maximum of efficiency with a minimum of effort."

Just what part steel will play in this new plan has not been clearly defined, but it is said manufacturers in this country may rest assured, efforts will be made to see that only such requirements as this country must furnish, will be ordered. This may mean an increased demand for steel from overseas or it may mean a reduction, but with the war department's determination to have 4,000,000 men in France by the end of 1919, producers, it is declared, may feel sure there will be little if any falling off in the demand for war steel.

Ratifies Fixed Prices

Washington, Aug. 12.—Further safeguards have been thrown about the war department's methods in making contracts. The superior board of re-

view of the general staff has decided that fixed price contracts shall be used wherever possible, and that the board's ratification is necessary in every instance where a cost plus contract is considered necessary for the best interests of the government. Even then it is mandatory that a cost plus fixed compensation contract be used rather than a cost plus percentage contract. The board has further ruled that no cost plus contract shall be made without the approval of the particular supply bureau's board of review. Such boards are composed of officers and civilians who have not participated in the preliminary arrangements of the contract. They have been organized in every supply bureau and it is expected that they will render valuable service.

Gun Plant in France Will Rival Krupp

WASHINGTON, Aug. 13.—The ordnance plant now being built on Neville island for the war department by the United States Steel Corp. under an appropriation by congress of $30,000,000 is to have a counterpart in France which calls for an expenditure of from $25,000,000 to $30,000,000. This counterpart is to be a plant for relining the heavy railroad guns in use by the American expeditionary forces. This project "is one of the largest undertaken by the ordnance department" and as to size it is said "it will be comparable to the Krupp works at Essen."

The announcement by the ordnance department says approval has been given for plans for the manufacture of machine tool equipment for the plant, the machine tools including gun-boring lathes, engine lathes, grinders and rifling machines, which are to cost between $12,000,000 and $15,000,000. In addition, the plant is to have extensive shrinking pits, giant traveling cranes, an electrical generating plant, a huge boiler house and adequate housing facilities for the entire project.

Giant Planer Being Built

The statement is made that for gun-boring lathes which are designed for a 102-inch swing, "there is under construction at one of the machine tool factories in this country a giant planer, the base of which is so long that a correction had to be made in the design to take care of the earth's curvature." This base is 500 feet long, "the planer alone to cost $450,000 and the lathes it will help make will approximate, in the aggregate, $6,500,000.

The announcement continues:

"Engineering work by the ordnance department in the development of the entire project was completed in less than 30 days after its inception. In that period the plans have been reviewed and approved by the chief of ordnance, the project has been passed by the clearance committee of the war industries board, negotiations have been concluded with machine tool builders, and procurement orders have actually been issued for production of the gun boring lathes of various designs and sizes required.

"The relining of big guns is one of the biggest salvage operations in the war. Several times the value of these big guns is saved by this process. Owing to the tremendous heat generated by the charge when the big guns are fired, their accuracy cannot be assured after a few hundred shots unless they are relined, notwithstanding the fact that all other parts except the lining are practically as good as when installed.

"When a gun is brought into the shop to be relined, the old lining is first bored out. The jacket is then heated ,a new lining inserted, and the gun then dipped into a shrinkage pit, which shrinks the jacket tightly around the new lining. This process may be repeated several times with every gun without bringing about injurious effects.

Capital Odds and Ends

WASHINGTON, Aug. 13.—The fuel administration has issued an order establishing the maximum price of $6.50 ovens for blast furnace coke and of $7.50 ovens for 72 selected foundry coke made at Pike county, Kentucky, effective July 29. An exception of this price rule is made in the case of the Marrowbone Mining Co.

* * *

The bureau of industrial housing and transportation has awarded the Cauldwell-Wingate Co., New York, a contract for the construction of apartments and houses in Bridgeport, Conn., to provide accommodations for 600 families. The bureau's plans for the construction of 14 dormitories with mess halls and kitchens, 14 apartments, and 300 houses for navy yard employes and their families at Washington, have been completed, and bids are requested.

* * *

A division of hardware and metals, with headquarters in Washington, has been created by the quartermasters corps. William A. Graham is chief; H. L. Arnold, assistant chief on outside relations; Maj. H. P. Hill, assistant chief on inside relations; George W. Welles, chief of procurement branch No. 1, metals and heavy hardware; William F. Fusting, chief of branch No. 2, tools and hardware sundries; W. J. Peck, chief, branch No. 3, kitchen and camp equipment, and Thomas M. Lynch, chief, methods and service.

* * *

More than 80,000 mechanics and laborers are employed at navy yards and stations and there are about 10,000 employes in the navy department and its various bureaus and stations, in addition to the military branches of the service, according to Secretary Daniels. This makes an approximate total of 594,000 persons in naval establishment, 503,792 of which are in the fighting branch. Of these 219,158 are in the regular navy, 219,566 in the naval reserve force, 58,463 in the marine corps, and 6605 in the coast guard.

* * *

American farmers have received 75,000 tons of nitrate of soda from Chile, in spite of the shortage of ships and two shipwrecks. The nitrate was purchased through the war industries board and distributed by the department of agriculture, selling at $75.50 per ton at ports, its cost as nearly as could be determined in advance, according to the bureau of markets. Applications were received in February for more than 120,000 tons, the total amount purchased in Chile. Owing to the shortage in ships between 35,000 and 40,000 tons of the order still are in Chile.

To Curb Scrap Thefts

Safeguards against the sale of stolen scrap are provided in the Texas law which went in effect June 27. The law requires junk dealers to obtain affidavits of persons from whom they purchase goods, the affidavits to be sworn to by witnesses, stating how the persons came into possession of the goods. If the seller is a minor the purchaser is required to obtain an affidavit from his parents. The law applies only to transactions in less than carload lots and its primary purpose is to prevent the sale of stolen scrap iron and metal products, transactions in fuel, feed, foodstuffs, furniture, liquids and other articles being exempted.

Ford Production

Curtailed to 700,000 Cars Yearly by Government Conversion of Plant

Detroit, Mich., Aug. 13.—Retail sales aggregating between $300,000,000 and $350,000,000 on a production of 700,000 motor cars are reported in a semi-official estimate of the Ford Motor Co.'s business for the fiscal year ending July 31. The previous year the production was 785,000 cars and normal production would have reached close to 1,000,000 in the past year had the plant not been converted to war work. During a period of 10 months and 24 days, up to May 24, the company produced 651,191 cars. On June 10 there were 110,607 unfilled orders on the company's books for cars of a total value of $51,071,745. Failure to produce these cars deprived the government of special war taxes of $1,342,642.

Assets of the Regal Motor Co., including a factory with 300,000 feet of floor space, have been purchased by Maurice Rothschild, who will reorganize the company for after-the-war business. Mr. Rothschild, who is a Chicago and Detroit capitalist, paid $500,000 for the property, which before the war had been appraised at $1,200,000. He was a stockholder and creditor of the original company.

Motors Metal Mfg. Co. has let the steel contracts for two factory additions to Detroit Steel Products Co.

General Aluminum & Brass Mfg. Co. has let the general contract for its three-story factory to John Finn & Son and the contract for its vacuum steam heating plant to the Irvine & Meier Co.

Charles Bohn Foundry Co., has let the contract for a foundry building to the Russell Wheel & Foundry Co.

W. E. Wood Co. is erecting a one-story foundry for the General Motors Co.

Chicago Penumatic Tool Co. will erect a one-story addition to its plant.

Hayes File Co., will build a power house for its plant.

Flint Scrap Iron & Metal Co. has let a contract for the erection of a one-story factory in Flint, Mich., to the W. E. Wood Co., of Detroit.

Detroit Shipbuilding Co. has let contracts for its three-story factory and three-story hoist house to the Bryant & Detwiler Co.

Stroh Castings Co., is building additions to its foundry.

Lewis-Hall Iron Works has the contract for plant additions for the Sewell Cushion Wheel Co.

Aluminum Castings Co. is completing additions and alterations to its foundry and core rooms.

Steel Tonnage for July Shows Small Loss

Unfilled bookings of the United States Steel Corp. as of July 31 took a drop of 35,065 tons, or 0.039 per cent, the total aggregating 8,883,801 tons. This total compares with 9,593,592 on July 31, 1917. Of the sevent months to be reported so far this year only two January and June, have shown a gain over the preceding month. From April 30, 1916, to date the monthly record of unfilled tonnage is as follows:

Date	Total	Change, tonnage	Change, per cent
July 31, 1918..	8,883,801	35,065—	.39—
June 30, 1918..	8,918,866	581,243+	6.90+
May 31, 1918..	8,337,623	404,259—	4.60—
Apr. 30, 1918..	8,741,882	314,522—	3.47—
Mar. 31, 1918..	9,009,675	232,049—	2.49—
Feb. 28, 1918..	9,288,453	189,400—	1.99—
Jan. 31, 1918..	9,477,853	96,135+	1.02+
Dec. 31, 1917..	9,381,718	484,612+	5.44+
Nov. 30, 1917..	8,897,106	112,569—	1.24—
Oct. 31, 1917..	9,009,675	823,802—	8.37—
Sep. 30, 1917..	9,833,477	573,572—	5.51—
Aug. 31, 1917..	10,407,049	433,115—	4.16—
July 31, 1917..	10,844,164	539,123—	4.74—
June 30, 1917..	11,383,287	503,304—	4.24—
May 31, 1917..	11,886,591	296,492—	2.43—
Apr. 30, 1917..	12,183,083	471,439+	4.02+
Mar. 31, 1917..	11,711,644	134,947+	1.16+
Feb. 28, 1917..	11,576,697	102,643+	0.90+
Jan. 31, 1917..	11,474,054	73,232—	0.64—
Dec. 31, 1916..	11,547,286	488,744+	4.43+
Nov. 30, 1916..	11,058,542	1,043,282+	10.41+
Oct. 31, 1916..	10,015,260	492,676+	5.18+
Sep. 30, 1916..	9,522,584	137,133—	1.42—
Aug. 31, 1916..	9,660,357	66,765+	.69+
July 31, 1916..	9,593,592	46,866—	0.48—
June 30, 1916..	9,640,458	297,340—	3.09—
May 31, 1916..	9,937,798	108,247+	1.11+
Apr. 30, 1916..	9,829,551	498,550+	5.34+

Will Train Engineers

The Woods Industrial Engineering Co., Bridgeport, Conn., announces that it has prepared a mail order course of study in industrial engineering. Clinton E. Woods, president, is the author of a number of standard works on the subject and his plans have been adopted by the United States government for use in plants such as the Remington Arms Co., the Bullard Machine Tool Co., and the Liberty Ordnance Co. The data on which the course of instruction is based has been gathered from Mr. Wood's personal experience and from the experience of a large staff of experts employed by him in regular practice. The course will enable the student to qualify as a professional industrial engineer.

The P. & M. Co., Railway Exchange building, Chicago, has taken over the exclusive manufacture of the Ajax rail anchors formerly made by the Ajax Rail Anchor Co.

New Steel Plant

May Be Built By Woodward Iron Co. —Pushing Coke Works

Birmingham, Ala., Aug. 13.—Great interest has been aroused by the announcement that recommendation had been made to the war industries board for the financing by the government of a $25,000,000 steel plant to be built at the works of the Woodward Iron Co., in the immediate Birmingham district. A. H. Woodward, chairman of the executive committee, and R. H. Bannister, president of the Woodward Iron Co., have been in Washington in conference with the authorities there and also in New York in conference with the board of directors of the company with regard to the enterprise.

The plant will include besides the steel works and mills, a steel foundry. This will be the first of its kind in the south. The new works is expected to be completed within 12 months after construction work begins. The Woodward company has several thousand acres of land suitable for the proposed plant. The company has five blast furnaces and two more could be added readily.

Further steps were taken the past week looking towards an early start on the construction of the 120 Semet-Solvay by-product coke ovens to be erected by the Sloss-Sheffield Steel & Iron Co. Engineers have been going over the site. The contract calls for completion within 12 months. The Birmingham Coke & By-product Co. in which Morris W. Bush, Horace Hammond and associates are interested and which will have government backing to the amount of $2,500,000 to $3,000,000, will put up 50 Koppers by-product ovens. The contract calls for completion of the plant within 10 months. Engineers have gone over the site and equipment orders have been placed. The Tennessee Coal, Iron & Railroad Co. is pushing work on the 154 Koppers by-product ovens being erected at Fairfield. It will be five months before the plant will be completed.

Trailer Order Placed

The Ohio Trailer Co., Nottingham, O., ha sreceived an order from the government for 350 to 400 trailers which may be attached to trucks and used in the transportation of heavy ordnance. This is only a portion of an original inquiry for over 3000 such trailers. The International Steel Tie Co., Cleveland, is doubling the size of its plant to make the steel parts necessary for these trailers.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

CLARENCE E. DRAYER, who has been elected secretary of the American Association of Engineers, 29 South La Salle street, Chicago, has been actively engaged in engineering society work both local and national in character for the past eight years. Upon graduation from a Cleveland college, he served western railroads until 1910. He then returned to Cleveland in the capacity of field engineer for the Nickel Plate railroad on grade elimination work. He joined the Cleveland Engineering society and inaugurated many ways of advancing engineers in public esteem and offered many suggestions to engineers along the lines of self-training. After two years' work in Cleveland, he began to carry his message to other societies. In 1915, he became associated with Dr. F. H. Newell in the formation of the committee on engineering co-operation of which he is secretary. He organized and is secretary of the Ohio Association of Technical Societies. He is co-editor of "Engineering as a Career", a series of articles giving advice to young men. For several years, he was editorial correspondent for "Engineering News" and "Engineering News-Record", in which journals most of his articles on engineering organization have appeared. For two years he served the Cleveland Engineering Society as secretary and was a member of its board of directors, when elected secretary of the American Association of Engineers. It was Mr. Drayer who formulated the plan of combined membership between the American Association of Engineers and the Cleveland Engineering Society. The present outlook is that this plan may be adopted by other societies.

A. C. Westfall, former traffic manager of the Cadillac Motor Car Co Detroit, has become traffic manager of the Lincoln Motor Co., manufacturers of Liberty motors.

Thomas McDonald, consulting engineer of the Youngstown district mills of the Carnegie Steel Co. and former general superintendent, has been named the manufacturers' representative on the community labor board of the United States employment service just being inaugurated at Youngstown. The labor member has not yet been named.

Richard E. Holcomb has been appointed acting secretary of the employers' association of the lower Naugatuck valley, Derby, Conn., succeeding J. Daniel Hoyt.

Robert C. Falconer, recently appointed chief engineer of the Erie railroad, was formerly connected with the McClintic-Marshall Co. and the American Bridge Co.

L. W. Hamilton has been elected president and general manager of the Lane Motor Truck Co., of Kalamazoo, Mich., succeeding Dr. W. W. Lang, resigned. Edward W. Bitzler has been named secretary-treasurer.

Robert Gross, who recently resigned as sales agent in charge of pig iron for the Bethlehem Steel Co., has been appointed general manager of sales of Robert C. Lea & Co., Philadelphia.

Loring G. Calkins, who recently resigned from the Chicago office of Rogers, Brown & Co., after 12 years' service, has taken a position with Halsey, Stuart & Co., investment bankers, Chicago.

B. P. Williams, St. Louis, vice president of Hickman, Williams & Co., has removed to Washington where he will assist in the allocation of southern pig iron under the direction of J. L. Replogle, steel director.

A. G. Delany, salesman for the American Brake Shoe & Foundry Co., with headquarters at Chicago, has been made manager at Minneapolis, in charge of sales in the northwest. He has been connected with the Chicago office since 1911.

James S. Keightly, who has been in charge of the purchasing department of the Great Lakes Engineering Works, Detroit, for a number of years, has resigned, and has been succeeded by E. C. Kerrigan, who has received the appointment of general purchasing agent.

D. V. Foster, formerly assistant general sales agent of the Midvale Steel Co. and later connected with the General sales department in the Washington office of the Midvale Steel & Ordnance Co. and Cambria Steel Co., has joined the sales organization of the Hess Steel Corp., Baltimore, Md. He will represent the latter company in the New York and New England territory with headquarters at New York City.

Frederick G. Platt, president of the New Britain Machine Co., New Britain, Conn., has been elected vice president of the Meriden Cutlery Co., Meriden, Conn., which was taken over recently by Landers, Frary & Clark, New Britain, Conn. Homer A. Curtiss of the latter corporation has been elected treasurer of the Meriden Cutlery Co., of which he was formerly president. Arthur S. Lane, secretary of the Meriden Cutlery Co., has resigned as a result of the change in ownership.

M. E. Allen, a structural engineer, has become affiliated with the Mobile Shipbuilding Co., Mobile, Ala. R. W. Baily, mechanical engineer, is associated with the Birmingham Steel Corp., Birmingham, Ala. These two formerly were located in Chicago as the Baily & Allen Co. The Chicago office has been discontinued for the duration of the war. Arrangements have been made with George Gibbs, First National bank building, Milwaukee, to take care of customers.

John E. Deckman, formerly general superintendent of the American Ball Axle plant of the Standard Parts Co., Cleveland, has been promoted to a position connected with the management of the 14 plants operated by the company. C. D. Austin succeeds him. Mr. Deckman's promotion was based on his success in the management of munition making. In honor of his appointment the general staff of the Standard Parts Co., tendered him a banquet recently.

R. T. Hodgkins has been made general sales manager of the Cleveland Tractor Co., Cleveland. For a number of years he has been head of the sales organization of the hoisting machinery department of the Yale & Towne Mfg. Co., New York City, and for the past four years general sales manager of the Studebaker Corp. Mr. Hodgkins succeeds W. J. Urquhart in the sales supervision of

the Cleveland Tractor Co., Mr. Urquhart retiring from his activities in order to take a much needed rest.

T. L. Loose, formerly affiliated with the Hendee Mfg. Co., Springfield, Mass., has been made manager of the Canton spring and axle plants of the Standard Parts Co., Cleveland. He succeeds J. B. Childe, who has been transferred to the company's general office in Cleveland. Other changes in the Standard Parts organization are as follows: F. F. Grimmelsman, former assistant manager of the Hess-Pontiac plant, is now manager of the Perfection Spring plant; H. C. Clay becomes spring production manager with headquarters in the general offices; W. L. Woodward, assistant manager of the rim and tube plant, succeeds J. C. Manternach, who resigned July 1 as manager; George W. Kleinert, former mechanical supervisor of Standard Parts plants, succeeds Carl H. Clement in charge of the bearing plant at Toledo; J. J. Conroy succeeds C. G. Steinbicker as manager of the Hess-Cincinnati plant; Mr. Steinbicker is now in the accounting division of the general offices; C. S. Warner, who formerly had charge of the spring department at Cincinnati, is now plant manager at the Ansted works, Connersville, Ind.; and B. A. Winborn, sales manager of the Perfection heater division, is likewise general manager.

High Royalties on Ore

Insight into the increased royalties received for Mesabi iron ore is given in the eleventh annual report of the trustees of the Great Northern Iron Ore Properties, just issued. On these Hill properties, royalties of from 12.5 cents to 36 cents are being paid on old leases, including such mines as the Mahoning, Utica, Leetonia and Stevenson. On leases made since March 1, 1912, royalties run variously from 55 cents to $1.15, from 15 to 30 per cent of the total ore, 50 per cent of the proceeds, and $1.55 at dock. Late leases show the highest rates.

Imports of Manganese Ore Continue to Drop

Imports of ferromanganese in June were considerably heavier than during the corresponding month of 1917, and were practically on the same monthly basis as for the preceding 12-month period. Manganese ore receipts were much less than in June, 1917, and the decline from the tonnage of the preceding months of 1918 also was very marked. The imports of manganese ore of 38,427 tons compared with an average of 46,501 tons in the 12 months period which ended June, 1918.

The comparative imports of various ferroalloys and ores entering into steel production for June, 1918, and for the 12 months ending with June, in gross tons are as follows:

	June 18	June 17	June 18	June 17
Ferromanganese	5,739	3,817	33,259	73,745
Ferrosilicon	146	869	5,419	8,715
Manganese ore..	38,427	62,778	558,018	656,088
Tungsten bearing ore.....	656	343	5,646	3,823
Nickel, nickel oxide and matte	2,987	6,371	58,776	60,132

To Begin Plant

Construction of a new plant of the Pacific Coast Steel Co. at Willbridge, Oreg., is expected to commence soon. T. S. Clingan, manager of the company, recently visited the east, to purchase material, tools, and other equipment. Since the company's products will be of an essential character, the necessary priorities have been arranged The new plant will be located on a 30-acre site and initially will consist of two open-hearth furnaces. Billet and bar mills are expected to be included. The Pacific Coast Steel Co. operates mills at Seattle and San Francisco and a blast furnace at Irondale, Wash.

British Exports Drop

Exports of iron and steel products from Great Britain excluding ore, for June, 1918, totaled 154,506 tons compared with 220,304 tons in the corresponding month of 1917. The quantity of material exported in the first half of the year, ending with June, was 823,236 tons, compared with 1,236,990 tons for the first half of 1917. The largest single item of June exports was in pig iron with 51,834 tons shipped compared with 86,793 tons in June, 1917. Tin plate and sheets amounted to 22,915 tons as against 18,975 tons in the preceding year; steel blooms, etc., 9804 tons against 15,698 tons black sheets, 10,819 tons against 15,760 tons. Imports of iron and steel excluding iron ore and including scrap, in June, were 20,312 tons compared with 33,489 tons in June, 1917. The six months import for 1918 totaled 144,725 tons against 202,176 tons in 1917. The product received in largest amount, was pig iron with 10,203 tons against 11,616 tons for similar months in the preceding year. In wire, the imports were 3091 tons against 1180 tons.

American-made motor cars with flanged wheels are used by officials of Canadian government railways for inspection of tracks.

Ingot Output

Falls Off Slightly Last Month—Parallels Pig Iron Record

Steel ingot and pig iron production is being maintained at practically the same rate. The tonnage of steel ingots produced in July exceeded the June output, but a comparison of the daily averages shows a slight falling off for last month. This was also true in the case of pig iron, the July daily average being 584 tons below that for June, while the total production for the month increased.

Figures compiled by the American Iron and Steel institute from reports sent in by 29 companies which in 1916 made 88.14 per cent of the country's total output, indicate a production of 3,113,635 tons of steel ingots in July, a gain of 30,189 tons compared with the June total of 3,083,446 tons, and 174,520 tons greater than July, 1917, when 2,939,115 tons of ingots were produced. The daily average for last month was 100,439 tons, 2342 tons below the June daily average of 102,981 tons.

The record of steel ingot production by these 29 companies since June, 1917, is as follows:

Months	Open hearth, gross tons	Bessemer, gross tons	All other, gross tons	Total, gross tons
June, '17	2,265,772	809,552	8,605	3,083,929
July	2,152,479	777,171	9,465	2,939,115
August	2,251,013	863,873	8,331	3,123,217
September	2,195,556	770,064	6,639	2,972,259
October	2,475,754	870,494	5,687	3,351,935
November	2,384,218	772,489	9,550	3,166,257
December	2,195,832	524,084	13,806	2,733,722
1918:				
January	1,763,356	429,588	10,901	2,203,845
February	1,805,233	454,457	14,051	2,273,741
March	2,331,048	763,255	16,078	3,110,381
April	2,377,974	769,249	16,187	3,163,410
May	2,475,131	796,244	15,858	3,287,233
June	2,281,718	786,380	15,348	3,083,446
July	2,311,545	784,997	17,093	3,113,635

Gear Meeting Called

The semi-annual meeting of the American Gear Manufacturers association will be held at the Onondaga Hotel, Syracuse, N. Y., September 19, 20 and 21. Announcement of the program will be given in a later issue.

Makes Improvements

Extensive improvements are about to be made by the Fulton Steel Corp., 149 Broadway, New York, to its plant at Fulton, N. Y. These will include the installation of a 6-ton electric furnace of the Heroult type, 10-ton crane, 14-inch bar mill, 5500-pound hammer, several new reheating furnaces, two annealing furnaces, new chipping equipment, air tools, grinders, a 350-horsepower boiler plant, and other extensions. It is expected that the above equipment will be in operation by the middle of October.

Demand U. S. End Holdup by Labor

Manufacturers Grow Insistent That Government Take Necessary Measures to Supply Skilled Labor and Put Ban on Coercion—Nation's Interests in War Imperiled by Union Leaders' "Strategy"

WHILE manufacturers engaged in work of the most vital nature to the government continue to be harassed by coercive tactics of labor on one hand and the shortage of labor, skilled and unskilled, on the other the hope and expectation that the government will afford a greater measure of relief has grown almost to a demand. Coincident with reports of strikes and disturbances calculated to impede the production of supplies essential to keep our armies on the move come statements by the manufacturers that it is high-time the government took drastic steps to supply them with the necessary men of the proper qualifications and then keep the men on the job. The system of priority regulation in the employment of labor, now considered in Washington, is heralded as a step in the proper direction but manufacturers engaged in war production are insistent on broadening the scope of such regulation to include skilled labor.

While a shortage of more than 500,000 men in unskilled labor was revealed by the federal employment service's questionnaire, the shortage of skilled labor is said to be far more serious, resulting in production falling far behind demand. Efforts to obtain skilled workmen have extended to bounds unbelievable before the war, the raising of wages to a higher percentage than the increase in the cost of living, the establishment of generous bonus systems, profit sharing and the giving to the better class of workmen an interest in the companies. Yet manufacturers report they cannot get a sufficient number of workmen, and once having obtained some, they cannot rely on their remaining contented and putting forth their best efforts.

It is considered only a question of time before the federal powers take the necessary measures and the situation rights itself, for while the manufacturers are feeling the pinch and the government is the principal loser. Practically all current reports from the industrial centers set forth the fact that skilled mechanics are in great demand and cannot be had.

The turnover of labor of the unskilled class is reported diminishing as the United States employment service becomes better organized. While advertising for unskilled labor has stopped, manufacturers are still advertising for women and girls, as this is not prohibited by the general order affecting unskilled labor.

One of the typical instances of coercion being practiced by skilled labor is that in the Mahoning valley, where molders in one plant made a demand for a basic 8-hour day and a minimum wage of $6 a day. They took their case to the war labor board and their employer was notified to appear in Washington in defense only 24 hours before the hearing was scheduled to occur. The men made no secret of the fact that if they won, the molders in the entire district were to take advantage of the victory while other crafts were also to adopt it as a precedent.

Fourteen thousand employes of the General Electric Co., at the Lynn, Mass., plant still are out on strike, having rejected a decision of the state board of conciliation and arbitration in the hope of obtaining a more generous settlement from the government.

Labor Conditions Show General Unrest

CONDITIONS in the Boston district are in a state of suspense, the only serious controversy at present being at the Lynn plant of the General Electric Co., where 14,000 employes are on strike. A decision, apparently fair, was reached in the case by the state board of conciliation and arbitration but this was rejected by the labor unions. At the instigation of Secretary Daniels and Secretary Baker the war labor board took over jurisdiction of the case and an investigation is now in progress. While there are no other disputes of significance it is likely the decision in the General Electric case will have a marked effect upon conditions in other plants in the Boston district.

Major Gitchell, representing Secretary Baker, was in Springfield recently to make an investigation of the labor trouble at the Smith & Wesson Co.'s plant but a decision has not been reached.

* * *

MILWAUKEE metalworking plants have adopted the eight-hour day as a basis for payment of employes, a voluntary agreement having been reached by all employers. Employes will continue to work 10 hours a day but will be paid time and a half for all time over an average of eight hours a day for six days a week. The Saturday half-holiday will be continued, the employes making up the time during the week before the overtime payment begins.

After 650 employes of three large machine shops at Madison, Wis., engaged in government work, walked out to enforce demands for higher wages and shorter hours, and the men in 10 other shops were ready to do likewise, federal labor referees succeeded in inducing the men to return to work pending a final settlement of the difficulty by

representatives of the war industries board. The men are demanding an 8-hour day, better working conditions, an increase in pay to 72½ cents an hour for skilled labor and recognition of the union. The plants of the Four Lakes Ordnance Co., Steihle Turret Machine Co., and the Madison-Kipp Lubricator Co., were closed from 11 o'clock Aug. 1 to the following morning because of the walkout. In the other 10 shops, about 3350 men remained at work pending the result of the strike.

* * *

REPORTS from the Mahoning valley district indicate that the recent increase in wages by the steel companies, following the lead of the United States Steel Corp., has had a salutary effect on the labor situation in the plants immediately concerned but has led to indications of unrest in other industries. There labor is pointing to the new steel wages as evidence that there should be a general raise in all lines.

The molders in one plant after making a demand, to include all the foundries, for the basic 8-hour day and a minimum wage of $6 a day, have taken their case to the war labor board. A hearing was held in Washington Aug. 8 with representatives present from one foundry which had been selected as the nominal victim by the union. The first intimation received by the employer that a hearing was to be held was a telegraphic communication delivered only 24 hours before the time set for the hearing, a time wholly inadequate to properly prepare the case. While the case involves but a small percentage of the skilled forces in the valley it is considered important inasmuch as the decision may be made the precedent for similar action in other crafts. As one manufacturer remarked: "The pledge to use no coercive measures to fasten unionism on industry seems to sit lightly on the shoulders of some leaders." The labor board deferred its decision.

* * *

THE organization of the federal community labor board in the Cincinnati district is rapidly nearing completion. The employers have selected J. M. Manley, secretary of the Cincinnati branch of the National Metal Trades association, as their representative while organized labor has named Joseph A. Cullen, business manager of the central labor council, as its representative. These two men will select a chairman. All questions concerning the recruiting and distribution of labor in the Cincinnati territory which includes Hamilton, Brown, Clermont and Highland counties, will be decided by the board subject to appeal by any member of the board to the state advisory board. All decisions are subject to regulations issued by the director general of the United States employment service, acting on the advice of the labor policies board and the department of labor.

The only labor difficulty in the Cincinnati district during the past two weeks was the strike of 14 coremakers employed by the Elmwood Castings Co., the men demanding $5.50 a day, an advance of 25 cents.

Board Asked for 500,000 Unskilled Laborers

EMPLOYERS lost no time in calling on the United States employment service for labor under the new regulations prohibiting them from recruiting. Felix Frankfurter, chairman of the war labor policies board, reports that orders and estimates for unskilled labor received by the employment service show a shortage of 500,000 men in plants that have reported and that this figure will be greatly augmented when returns are complete. The following statement is being sent to employers by the war labor policies board:

The successful operation of the central recruiting program can be assured only through the loyal cooperation of all whom it affects. Inevitably it will impose at the outset, and until it becomes fully effective, a degree of hardship upon some employers, though in the end its benefits will be shared by all. The utmost effort will be made to minimize and in so far as may be possible to equalize the burdens. Of necessity that effort will for some time fall short of complete success.

Those who suffer temporarily will, we feel assured, accept the burden as part of their contribution to the cause to which the President has pledged our all. They will realize that only through the enforcement of such a program can there be achieved the full utilization of our forces whereby that pledge may be redeemed and whereby there may be maintained the uninterrupted flow of food, munitions, and supplies which is the first essential to the winning of the war.

Because of the widespread realization of these facts, we believe that intentional violations of the regulations will be rare. If any shall occur, complaints thereof should be addressed to the federal director of employment for your state. If it is impossbile to deal effectively with the situation locally, the facts should be reported through the director general of the United States employment service to a committee of this board which has been constituted to investigate such complaints and to secure appropriate action by the war industries board and by all other enforcing governmental agencies in all cases where the complaints shall prove to be well founded.

Labor Notes

Ground has been broken for the first 50 homes to be erected at Ellwood City, Pa., for employes of the Shelby plant of the National Tube Co. These homes are to be completed in four months and the second 50 are to be completed in eight months.

More than 20,000 employes of plants in Milwaukee which are engaged in manufacturing material, equipment and supplies to be used in the government shipbuilding program have taken the pledge to remain at their work and give their best efforts so long as the war shall last. The campaign for pledges was carried on for a week by "Doc" Willis Moore, assisted by Lieut. Bowlby of the Eemergency Fleet corporation. From Milwaukee the workers went to Michigan.

Steel Exporters Meet

About a score of representatives and officials of steel exporting houses gathered at the Law institute, 120 Broadway, New York, Aug. 1, to consider present conditions in the steel export trade, growing out of the short supplies of steel and limited amount of vessel space. The general feeling of the meeting was that the war trade board appreciated the situation existing and was inclined to be as fair as possible under the circumstances The meeting was adjourned with no action having been taken and with general approval of the government's policies.

To Recover Toluol

The Kings County Lighting Co., Brooklyn, has entered into a contract with the war department by which it will erect a plant to be used for the recovery of toluol. The plant will cost $200,000, and will be operated by the Kings County Lighting Co. under the supervision of army officers. The contract provides that no profit whatever will go to the gas company.

Dorr E. Felt, regional advisor of the war industries board, in charge of Iowa, the northern half of Illinois and the northern third of Indiana, has opened an office in room 748 at 29 South La Salle street, Chicago. He is under the resources and conversion section of the war industries board.

Clears Up Difficulties of Jobbers

Steel Director Replogle Returns Formal Answers to Questions Which Have Been Confusing Industry—Mills Should Not Request Priority Certificates of Middlemen—Export Sales from Stock Not to be Replaced

PITTSBURGH, Aug. 13.—The position of jobbers with regard to getting supplies from steel mills and the policies that both must pursue under the rulings of the war industries board are set forth clearly in a letter dated Aug. 1 from J. Leonard Replogle, director of steel supply, addressed to George D. McIlvaine, secretary of the National Pipe & Supply association, Pittsburgh. The letter was written as a result of a conference held in Washington on the date mentioned, between Andrew Wheeler, chief of the bureau of warehouse distribution of the war industries board, and John Donnan, secretary of the Southern Hardware Jobbers' association, Alvin M. Smith, secretary of the Southern Supply & Machinery Dealers' association, and Mr. McIlvaine.

The analysis of the jobbers' situation made by Mr. Replogle is in the form of answers to questions which have been more or less perplexing to manufacturers and jobbers alike.

The letter of Mr. Replogle in full follows:

Geo. D. McIlvaine, Secy.,
National Pipe & Supplies Assn.,
Pittsburgh, Pa.
Dear Sir:

Several questions having been submitted to me by several of the secretaries of the associations, I will endeavor to answer them and give you herewith my best judgment in regard to same.

Demand Not Justified

The first question deals with manufacturers demanding of the jobbers in placing orders with them to furnish a priority certificate or government order number, and also a daily, weekly or monthly report of material in their line shipped from jobbers' stocks on government orders or for other essential purposes. In answer to this would state that manufacturers are not justified in making such demands on jobbers. The jobber having once filed his pledge with this office, should not be asked to do so again. He may simply notify his manufacturers that he has deposited his pledge. One notification to this effect is sufficient. No report of sales need be made by the jobber or manufacturer. The only report that he shall make is the monthly report, which is to be be sent to this office on the 5th of each month on forms prepared by us.

Question No.2, asking whether mills are justified in refusing to accept orders for less than five tons of a size of bars. This is something that is not directly in the line of this office. If the mills, due to their rolling conditions, are not able to change rolls or to make quantities of less than five tons, we have no power of forcing them to do so, and would suggest that jobbers accumulate their orders as far as possible so as to make the items desirable from a rolling mill standpoint.

Repairs Are Essential

Question No. 3, asking whether manufacturers or installers of lighting and water systems in country residences, cattle barns and stock yards, be classified as an essential: Would say that repairs to systems even in residences, should be considered essential, and material furnished for cattle barns and stock yards can easily be classified under the heading of food. Material for supplying water, sewerage and fire service would properly be classed under public utilities.

Question No. 4, asking whether it is obligatory for jobbers to require the loyalty pledge from all customers: This is only essential in the case of customers who are also retailers and likely to sell the material again. In this case it is necessary, so that the ultimate use of the material may be thoroughly ascertained. Any consumer or manufacturer who is engaged in essential operations is not required to sign any pledge.

Question No. 5, asking whether jobbers should decline to sell plumbers and steam fitters materials which are to be used in new buildings unless such new buildings are an essential part of the war program: My answer would be that the jobber must use his judgment largely in matters of this kind, and while there is a disposition to conserve steel of all kinds as much as possible, there would be no objection to selling pipe for this purpose if the jobber thought the work was at all of an important nature.

Nonessential Industries

Question No. 6: The various industries which you mention, covering moving pictures, soft drink and candy manufacturers, are absolutely nonessential industries. Automobile garages and bicycle repair shops I think should be taken care of as far as ordinary repairs are concerned, but no new ones erected. Brick manufacturers should be considered essential in so far as they furnish supplies for works of national importance.

Question No. 7, as to rating the jobber is entitled to after filing his loyalty pledge: The answer would be that his replace orders are automatically pleced under rating B-4.

Question No. 8, asking whether jobbers are still to report priorities on shipments, either from stock or direct to their customers: The priorities committee will no longer grant priorities to jobbers, and their only method of replacing their stock is to follow the rules which are laid down in the war industries board circular of July 3, namely, to sign the pledge and keep the monthly report of sales, replacing same the following month with a tonnage equivalent to the amount of sales of the preceding month.

Question No. 9: What line of steel products should be included in the miscellaneous column of the report? In reply to this, would suggest that items like cold rolled strips, rivets, structural and boiler, machine bolts, track bolts and railroad spikes, might be included under this head, as they constitute quite a heavy tonnage. Shelf hardware and manufactured hardware in general should not be reported, also articles composed partly of steel, such as shovels, etc.

Export Tonnage

Question No. 10, in regard to exports, as to whether this tonnage can be replaced: Would say the disposition of this office is to rule against the replacement of export tonnage. If an export license can be secured, it is understood that the license board have carefully considered the situation and that the jobber or manufacturer is entitled to make the shipment, but having gone out of the country, it reduces the stock of available steel which might have gone into more essential purposes, and should, therefore, not be included under the replacement order. In other words, the jobber is not to report export tonnage in his monthly report.

In regard to nails, there is no priority on these at present, and they are not on the conservation list. They may be shipped freely to jobbers in accordance with the mill's ability to do so without interfering with more important government orders.

Question: Should jobbers accept loylaty pledges of so-called syndicate buyers? The answer would be no; in all cases he should exact the pledge from the ultimate consignee.

Yours truly,
L. Leonard Replogle,
Director of Steel Supply.
Per Andrew Wheeler,
Chief of Bureau of Warehouse Distribution.

Delay in dismantling the Colorado Midland railroad has been granted at least until September when the Colorado supreme court reconvenes A. E. Castleton, receiver, petitioned for permission to dismantle and sell the road for scrap, but this was refused and an appeal will be taken.

Active Demand

Current For Leading Grades of Refractories—Production Keeps Up

PITTSBURGH, Aug. 13.—Production of refractories is keeping up well with demand, which is rather active for the leading grades. New by-product coke capacity is calling for good sized quantities of fire clay and silica brick, and additional open hearth furnace capacity also is calling for fair sized lots. Owing to the scarcity of chrome ore, bauxite brick is being bought more freely.

Refractories

(Per 1000 f. o. b. works)

FIRE CLAY BRICK.

(First Quality)

Pennsylvania	$45.00 to 55.00
Missouri-Illinois	55.00 to 65.00
Ohio	45.00 to 50.00
Kentucky	45.00 to 55.00
New England	55.00 to 65.00

FIRE CLAY BRICK

(Second Quality)

Pennsylvania	$40.00 to 50.00
Ohio	35.00
New England	48.00 to 58.00

SILICA BRICK.

Pennsylvania	$50.00 to 60.00
Chicago	55.50 to 65.50
Birmingham	45.00 to 55.00

MAGNESITE BRICK

(Per Net Ton)

9 x 4½ x 2½	$110.00 to 130.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	$135.00 to 140.00

BAUXITE BRICK

(Per Net Ton)

55 per cent	$40.00 base
76 per cent	100.00 base

While there is not much construction under way calling for magnesite brick, demand for this grade for repair work is about normal. The market is quotable at $110 to $130 per net ton f.o.b. works. Prompt deliveries are being made.

A plan of distribution looking to expeditious shipments from works to the nearest consuming points is being worked out for the war industries board.

Manufacturers in the Kentucky district report an increasing demand for high grade refractories. Car supply in that district is fairly good. Operations in that district are reported at about 85 per cent. Increasing cost of production especially in the labor item, is causing concern. Some companies have granted an advance of 10 per cent to their employes, effective Aug. 16. Adequate labor forces are more difficult to maintain.

LaBelle Iron Works, Steubenville, O., is negotiating for the real estate holdings of Cyrus Ferguson, consisting of approximately 400 acres, which adjoin the holdings of the company at North Follansbee, W. Va. What plans the company may have with regard to the use of the additional land are held in abeyance pending the completion of the negotiations.

Manganese Minerals Grow Greatly in 1916

Production of manganese and manganiferous ores in United States in 1916 amounted to 26,997 tons of ore containing 40 per cent of manganese or more; 176,130 tons of 15 to 40 per cent maganese, and 372,673 tons of 5 to 15 per cent manganese, according to the pamphlet on manganese and manganiferous ores in 1916 by D. F. Jewett just published by the United States geological survey. A comparative totals of the preceding year were 8708, 70,202 and 126,438 tons respectively. Of the 40 per cent ore, Arkansas produced 6131 tons, California 6054 tons, Virginia 4388 tons and Montana 3268 tons. Of the 15 to 40 per cent ore, Colorado's output was 90,850 tons, Minnesota's 37,710 tons and that of New Mexico, 16,575 tons. In the 5 to 15 per cent class, 202,693 tons were mined in Montana, 122,429 tons in Nevada and 32,487 tons in Virginia.

The imports of manganese ore in 1916 amounted to 576,321 tons of which 471,837 tons came from Brazil and 51,960 tons from India. The preceding year's report showed 320,778 tons, including 275,579 tons from Brazil and 36,450 from India. The output of manganiferous zinc residuum in 1916 was 198,817 tons. This compares with 159,318 tons in 1915. The ferromanganese produced in 1916 was 224,103 tons and of spiegeleisen 182,837 tons.

Obituaries

WILLIAM H. CONNELL, treasurer of the American Bridge Co., died Aug. 5 at Wilmington, Del. Mr. Connell, who was 73 years old, was recognized as one of the foremost bridge engineers in the United States. Prior to the formation of the American Bridge Co. in 1900 he was an officer in the Edge Moor Bridge Co. at Edge Moor, N. J., of which he was one of the organizers. When this company went into the American Bridge Co., Mr. Connell was elected treasurer of the latter company. He was widely known among steel men throughout the country. Until his health failed about three years ago, he has been a resident of Pittsburgh for many years.

John Calvin, who for many years was treasurer of the Bonniwell Calvin Iron Co., Kansas City, Mo., died recently in that city.

Harry J. Hess, machinery manufacturer, formerly of Scranton, Pa., died at his home, 200 East 115 street, New York City, August 7, aged 32 years.

Robert W. Hill died in Brookline, Mass., Aug. 9, aged 30, of tuberculosis. He was traveling salesman for the New York steel house of H. Boker & Co.

William Cabble Provost, treasurer of the William Cabble Excelsior Wire Works Mfg. Co., Brooklyn, died Aug. 5 from heart disease at his home in that city. Mr. Provost was 51 years of age, and was a member of the Bensonhurst Yacht, the Marine and Field and the Atlantic Yacht clubs.

Thomas Scott, who died recently at his home in Cleveland, had been in the employ of one firm, the M. A. Hanna Co., for 44 years. For about 37 years he represented the Hanna company as pig iron salesman. He was born in Esten, England, May 10, 1851, and located in Cleveland when 14 years old.

Richard Paxton, aged 54, assistant mechanical engineer for the American Bridge Co. at Ambridge, Pa., dropped dead on Aug. 4 at Elmhurst Inn, Sewickley, Pa., following a round of tennis. Mr. Paxton came to the Ambridge works in 1902, having previously been attached to the Pencoyd works near Philadelphia.

William Scott who was chief engineer for the P. & F. Corbin division of the American Hardware Corp., New Britain, Conn., died at his home in that city, July 21, aged 70 years. Had he lived until December, 1918, he would have been with the company 50 years. Born in Yorkshire, Eng., Oct. 11, 1847, he came to the United States Nov. 19, 1868, and entered the employ of the P. & F. Corbin Co., a week later.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Double Tax is to Reach All Profits

TWO systems of profits taxation probably will be embodied in our 1918 revenue law. It is proposed that the present system of levying the tax on excess profits, measured according to capitalization, will be retained. In addition, the pure war profits tax, such as exists in England, will be imposed. The war profits are to be the excess over the profits enjoyed during the prewar period without considering capitalization. The system which pays the higher tax will be applied to the corporation or individual. It is probable the tax on war profits will be 80 per cent, as recommended by the treasury.

The excess profits tax in principle is a levy on all profits above a given percentage on capital invested, while the war profits taxes will bear heavily on industries which were not enjoying much of a return before the war but are enjoying vastly increased returns at present. This will include the cotton industry of the South and farmers generally. The house ways and means committee early last week held out for the present system, while the treasury department advocated the double system and it is said the controversy became extremely heated. Toward the close of the week, however, Chairman Kitchin announced that the committee would adopt an alternative system as suggested, indicating that the present excess profits rates, however, would be increased.

Tax Board is Proposed

Provision for a tax advisory board of five members has been written into the new revenue bill. The board would continue in existence until one year after the war; its members would be appointed by the President and confirmed by the senate. This board would review and consider all matters submitted by commissioner of internal revenue and would also consider points at issue raised by tax payers. The recommendations and reports of the board would be made to the commissioner, who might or might not follow them.

The house ways and means committee also has decided to allow payment of income and excess profits taxes in three installments, with a discount of 1 1-9 per cent if all the tax is paid when due. This arrangement undoubtedly will be of much benefit in June next year, when the 1918 taxes are due. Much inconvenience and some embarrassment was felt in the collection of this year's large payments, but next year's levies will be two to three times larger, and if it were again necessary to pay the entire tax at a given date, serious consequences might ensue.

Luxury Tax Settled

In addition to the profits taxes, a luxury tax schedule has been adopted, involving a 10 per cent tax on such articles as jewelry, art objects, pianos and pipe organs, furs, cash registers, typewriters, phonographs and tapestries. The plan as to automobile taxes was changed. The first plan was to impose a tax based on the original price of the car. This was stricken from the tentative bill and a section proposing to tax automobiles according to horsepower was inserted. The new tax is $10 on automobiles of 23 horsepower and less; $20 on machines of 24 to 30 horsepower; $30 on machines of 31 to 40 horsepower; and $50 on machines of over 40 horsepower. The house ways and means committee started on the final stages of its work on the new revenue bill this week and its draft will probably be ready for the lower house in a short time.

Bethlehem Holders Create Consolidated Mortgage

Stockholders of the Bethlehem Steel Corp., at a special meeting in Newark, N. J., Aug. 8, approved the proposition to create a new consolidated mortgage not to exceed $500,000,000, and to pledge $70,000,000 worth of 30-year, consolidated mortgage, 6 per cent, sinking fund gold bonds to secure an issue of $50,000,000 worth of serial, 7 per cent gold notes. The contract under which a syndicate composed of the Guaranty Trust Co., the Bankers Trust Co., J. W. Seligman & Co., and the Chase Security Co., purchased all the notes also was ratified. President Grace said that $20,000,000 more would be required to complete the improvement program at the Sparrows Point plant on which $22,000,000 already has been spent. In addition, $12,400,000 are required to meet maturing obligations, and $15,000,000 for additional working capital.

After the meeting, President Grace stated that the orders on the books of the corporation total more than $650,000,000. He estimated the total gross business this year would be about $400,000,000, and that in 1919 it would exceed $500,000,000. Discussing production, Mr. Grace said that operations had been at maximum, a new record for the company. The corporations' shipyards now have a total of 65,000 men, and that about 5000 men will be added by the first of October. This compares with approximately 40,000 last May. The Liberty plant at Alameda, Cal., which will come in about the middle of next year, will require about 10,000 additional. In all, the corporation now has a total of 120,000 employes.

American Steel's Position

The financial position of the American Steel Co., Pittsburgh, is shown by its annual statement as of July 2, 1918, just issued. It shows quick assets of $3,164,658 as against quick liabilities of only $161,579. The quick assets include accounts receivable of $371,975; bills receivable, $1,560,000; cash, $465,512; United States government bonds, $325,000; and inventories, $442,170. The quick liabilities are made up of $71,579 in accounts payable and $90,000 of bills payable.

The statement shows the value of the company's plants is $691,092, while the plant improvements amount to $15,212. The company owns gas wells appraised

at $16,073. Common stock outstanding is $1,500,000 and preferred $1,500,000, whiel the surplus is given as $76,770. The profit and loss balance, according to the report, was $158,147 on Jan. 1, 1918, and for the first half of 1918 it was $499,282.

Midvale's Earnings Exceed Previous Quarters

Net earings of the Midvale Steel & Ordnance Co. for the second quarter and first half of 1918 are considerably ahead of corresponding periods in 1917, according to the quarterly report just issued. The net for the second quarter after allowance for federal war taxes, amounted to $12,108,753 compared with $10,833,544 for the second quarter of 1917 and $9,775,044 in the first quarter of the present year. The gain over the second quarter of last year and the first quarter of 1918 were $1,275,209 and $2,333,709 respectively. The allowance for war taxes was not made public in the report.

From the second quarter earnings, $2,778,485 was set aside for depreciation. The balance for dividends amounting to $8,545,433 compared with $8,258,790 in the corresponding quarter of 1917 and $7,800,341 in the first three months of this year. The balance for dividends of the quarter just ending is equal to $4.27 per share. Combining the second quarter reports, of the present year, a net income of $21,883,797 is shown for the first half of 1918, representing an increase of $1,379,542 over the first half of 1917. The balance for dividends of $16,345,784 was equal to $8.17 per share compared with $7.66 in 1917.

Would Issue Stock

Approval of an issue of $2,000,000 of $8,000,000 unauthorized, unissued common stock has been asked of the capital issues committee by the Trumbull Steel Co., Warren, O. If the request is granted, the stock will be offered at par to share holders and the proceeds will be used for additional working capital. The Trumbull company has $12,000,000 of outstanding capital at the present time, equally divided between common and preferred shares.

Steel Bonds Called

The Railway Steel Spring Co. has called the entire outstanding bonds of the Inter-Ocean Steel Co. for payment Oct. 1 at 105 and interest to Dec. 31. There are outstanding $2,967,000 5 per cent 20-year gold bonds on the Inter-Ocean plant. Retirement of this issue will leave the company with no funded debt and with $13,500,000 preferred and $13,500,000 common stock outstanding.

Promote Truck Use

A series of conferences to be held in various of the larger cities by users of automobile trucks under the auspices of the Truck Owners' Conference, Inc., 327 South La Salle street, Chicago, will open at Detroit, Sept. 19-20, at the Board of Commerce building. The purpose of the meeting is to secure greater efficiency in truck operation and to promote the use of this method of transportation in the interest of greater conservation of the freight car space.

Financial Crop Ends

The Chicago Steel & Wire Co., 10257 Torrence avenue, Chicago, has increased its capitalization from $60,000 to $100,000.

* * *

The sale of the Orenstein-Arthur Koppel Co., with works at Koppel, Pa., advertised for sale for Aug. 15 under the alien enemy act, has been postponed.

* * *

The Wickham Co., of New Jersey, Matawan, N. J., now is the corporate name of the concern, which was formerly the Matawan Steel & Iron Co.

* * *

The Avery Co., Peoria, Ill., manufacturers of tractors, farm implements, etc., has purchased the plant and business of the Davis Mfg. Co., Milwaukee. The plant hereafter will be known as the Avery Co., Milwaukee, Wis., plant.

* * *

Entire control of the Davis Mfg. Co., West Allis, Wis., has been acquired by the Avery Co., Peoria, Ill. The Davis plant has been producing tractor engines for the Avery Co. F. N. Davis will continue in the capacity of general manager of the Davis plant.

* * *

The Dale Brewster Machinery Co., Washington and Clinton streets, Chicago, dealer in machine tools, has surrendered its charter as an Illinois corporation and is continuing its business under a New York charter as the Dale-Brewster Machinery Co., Inc.

* * *

In the calendar year to date, it is understood that bookings by the General Electric Co., are running slightly ahead of last year. In 1917 the company booked orders totalling $246,778,900. Since Jan. 1 last business has been taken on at a rate which promises about $250,000,000 for the full year. In 1917 the company billed out to customers just under $197,000,000 worth of goods. Billings for 1918 may reach $225,000,000. Manufacturing and labor costs being higher, it is probable that General Electric this year will report a smaller percentage of net.

Supply Short

In Practically All Coal Tar Products —Ship Ammonium Sulphate

New York, Aug. 12.—A shortage of supply characterizes practically all coal tar products. It is estimated that August requirements of toluol call for fully 200,000 gallons more than the expected production. As a result, the war industries board has released to essential commercial consumers for August, only one-half the quantities asked for. Despite preparations to increase production, the shortage, is expected to continue for some months.

Since the recent large sales of benzol to the government, commercial consumers have bought heavily, with the result that the supply has been pretty well cleaned up for a number of months ahead. The output however is large and it is expected there will be enough supply to take care of requirements.

The recent heavy buying by the navy department has left the solvent naphtha market practically bare of supplies, and the price is largely nominal. Phenol, because of the recent large sales to Japan, and to domestic consumers, also is scarce. The entire production of naphthalin continues to be delivered on contracts so that practically none of this product is available for sale.

Sulphate of ammonia producers, due to the fact that government plants are not yet ready to use this product as rapidly as it is available, are able temporarily to accept some business from regular customers, and to deliver on old contracts. It is expected, however, that this situation will be only temporary. Producers may not sell for delivery more than 30 days ahead.

Coke Oven By-Products

Spot

Per Gallon at Producers Plant	
Pure benzol	$0.22 to .27
Toluol (on sales sanctioned by government) (tank cars)	1.50
Toluol (on sales sanctioned by government) drums	1.55
Toluol (for government)	1.50
Solvent naphtha	.20 to .25
Per Pound at Producers Plant	
Phenol	$0.43 to .45
Naphthalin (nominal)	.10 to .12
Per 100 Pounds at Seaboard	
Sulphate of ammonia (nom.)	$5.65 to 5.75

Contract

Pure benzol	nominal
Toluol	no market
Solvent naphtha	nominal
Per Pound at Producers Plant	
Phenol	$0.43 to .45
Per 100 Pounds at Seaboard	
Sulphate of ammonia (for commercial use)	no market
Sulphate of ammonia (for government)	$4.50

Tool Inquiries Continue Heavy

Great Rivalry Shown Among Buyers With Priority Certificates, With Little Chance for Non-essentials—Government in Market With $1,000,000 List—Chemical Plant Needs $4,000,000 Worth of Equipment

DEMAND for machinery and tools of practically all descriptions continues strong with manufacturers keeping busy answering inquiries and still busier endeavoring to make appreciable headway against the flood of orders. While dealing has become restricted almost entirely to industries engaged in war work, competition even in this field has become so strong that there is the liveliest kind of rivalry for certain machines and tools among buyers holding priority certificates, with little chance for those without such aids to delivery. Instances are numerable where deals have been closed for the sale of machines to buyers with certificates only to be upset by buyers with higher priorities. It is a case of the manufacturer or seller letting the buyers fight it out between themselves and the government to see who gets the supplies.

The American Cellulose & Chemical Co., Ltd., New York, has come into the market for between $3,000,000 and $4,000,000 worth of tools and special equipment for its new $5,000,000 plant in Cumberland, Md., this being one of the largest requirements of the week's new developments. The government has issued a list of machine tools of an approximate value of $1,000,000 for shipment to France for use in connection with military railroads.

There also is seen considerable interest by the trade in announcement by the war department that work will begin soon on the $30,000,000 gun relining plant in France. Requirements of the Neville island plant of the United States Steel Corp., of the Newport News Shipbuilding & Drydock Co., of the Air Nitrates Co., and of the Pierce-Arrow Motor Co., are among the most important business at hand. A considerable quantity of equipment is being sent to Canada for shell-making plants, the Fairbanks, Morse & Co., now filling an order for $500,000 worth of tools for three projectile plants in Ontario.

In the Pittsburgh district chief interest centers in supplying equipment for the Neville island plant, while in the Chicago and Cleveland districts dealers are interested in a miscellaneous list of large proportions.

Government in Market for Big Tool List

A LIST of machine tools, involving more than $1,000,000, is now being issued to the eastern machinery trade by the newly appointed director of purchases for military railways. Major Whitford, formerly of the Union Pacific railroad, occupies this position and has headquarters in the general engineering depot at Fourteenth and U streets, Washington. His department is in no way connected with the railroad administration. The equipment to be purchased comprises a miscellaneous assortment of tools, all for shipment to France.

Considerable equipment also will be purchased at this time by the American Cellulose & Chemical Co. Ltd., 681 Fifth avenue, New York, for a $5,000,000 plant now under construction at Cumberland, Md. A complete list of machine shop tools is to be bought in addition to considerable special equipment, which in all will amount from $3,000,000 to $4,000,000. The company, organized and operated with English capital, has large contracts with the United States government to manufacture acetate of cellulose, a material used to coat wings of airplanes.

While the general run of miscellaneous inquiry during the past week was of only fair volume, the trade has found itself well occupied with the business at hand, which includes the huge requirements of the Neville island plant of the United States Steel Corp., the sizable lists of the Newport News Shipbuilding & Drydock Co., the Air Nitrates Co., the Pierce-Arrow Motor Co., and a few other companies that are engaged in war work. Quite a little interest is shown in the trade over the announcement this week by the war departmeht that work will start shortly on the construction of a $30,000,000 gun relining plant in France. The consulate general of the Argentine republic, 17 Battery place, New York city, has full information relative to a large sulphuric acid plant to be erected in South America. All bids must be in the office of the secretary of the council of public work, Buenos Aires, by Nov. 8.

A good quality of equipment is being shipped into Canada for shell-making purposes. Fairbanks, Morse & Co., 30 Church, New York city, is now acting on an order for almost $500,000 worth of tools for three projectile plants in Ontario. These plants are the Leeside Munitions Co., Leeside; the Motor Trucks Co., Ltd.; Brantford; and E. Leonard & Sons, London, Ont. The A. P. Smith Mfg. Co., East Orange, N. J., has received a new shell contract from the government. This order calls for 240 millimeter shells, which are considerably larger than those heretofore turned out by the company, and will necessitate the purchase of additional equipment. Buying by the railroads continues light in the east. Inquiries are coming out from time to time, but action on these requirements is slow. Included among recent inquiries is that of the southern division of the Pennsylvania railroad, involving about 45 tools. The Erie railroad also has out a list of several tools for its repair shops in Jersey City, N. J.

Masters of Every Situation
In the works of war and peace, wherever there are emergencies and exigencies to be met, stresses and strains to be overcome, and twists and jerks to be resisted—where comfort and safety or even human life lie at their mercy—Agathon Alloy Steels prove their mettle.
Thousands of times every day, from war-ridden France to bustling 'Frisco, Agathon Alloys are showing themselves the Masters of Every Situation.
Agathon Alloys will Serve Your Purpose Best.
The Central Steel Co.
Massillon Ohio Agathon City
Branch Offices:
Detroit Office: 326-27-28 Ford Bldg., F. Walter Guibert, District Representative
Cleveland Office: Hickox Bldg., The Hamil-Hickox Company, District Representative
Chicago Office: 1370 Peoples Gas Bldg., 122 So. Michigan Blvd., C. H. Beach, Dist. Sales Mgr.
Philadelphia Office: 603 Widener Building, Frank Wallace, District Sales Manager
Syracuse Office: 621 University Block, T. B. Davies, District Sales Manager
J. E. Dockendorff & Co., 20 Broad Street, New York, General Export Agents
AGATHON STEELS
TRADE MARK
AGATHON
ALLOY STEELS

While considerable business has been booked of late by builders of electric cranes the volume as yet has not been as large as expected and there continues quite a little competition. Some builders of electric cranes, nevertheless, are refusing orders unless accompanied by a priority certificate of sufficiently satisfactory rating. The majority, however, appear willing to accept whatever business is offered of a lesser essential nature, subject to subsequent priority. The feature of the market at present is more the actual business pending rather than the volume of business being placed or coming out. It appears likely that as long as the Neville island list is up in its entirety this situation will continue for the present. There has been, however, a fair amount of buying in both locomotive and overhead cranes during the past week or 10 days. The Air Nitrates Co., New York city, has placed eight locomotive cranes, four of which went to the Ohio Locomotive Crane Co. These cranes are of 15 and 20 tons capacity and are for the government's new nitrates plant near Toledo, O. The Lehigh Coal & Navigation Co., Philadelphia, has bought two 15-ton locomotive cranes from the Link-Belt Co. The McClenahan Stone Machine Co., Hollidaysburg, Pa., has purchased a 10-ton overhead crane, with 40-foot span, from the Shepard Electric Crane & Hoist Co. The Sun Shipbuilding Co. has awarded one 100-ton and six 15-ton cranes to the Pawling & Harnishfeger Co. for a new marine boiler shop. Several cranes for this plant are still pending. The Federal Shipbuilding Co. has bought two 20-ton and three 10-ton travelers from the Milwaukee Electric Crane & Mfg. Co. This latter company has also been awarded a 5-ton crane by the Vulcan Iron Works, Wilkes-Barre, Pa. The two 5 and 10-ton overhead cranes mentioned in last week's issue as having been awarded by the Driver-Harris Co., Harrison, N. J., went to Alfred Box & Co. The Barber Asphalt Co., is understood to have placed its requirements with the Whiting Foundry & Equipment Co. A 5-ton electric crane has been awarded by the Kennedy Foundry Co., Baltimore, to the Chesapeake Iron Works of that city. The crane requirements of the Alameda plant of the Bethlehem Shipbuilding Corp. are undergoing several changes, and it is understood in this connection that the tower whirlers for this plant which were placed with Terry & Tench, have been reduced from 30 to 20 in number. The three hammerhead cranes to be purchased for the Alameda yard still are pending.

The largest inquiry to come out during the past week is that of the Air Nitrates Co., New York city, comprising 11 traveling cranes for the government nitrates plant, near Toledo, O. Specifications follow: Five 20-ton, 47-foot span; two 10-ton, 27-foot span; and four 5-ton cranes, with 27-foot span. The Otis Elevator Co., 250 Eleventh avenue, New York city, is inquiring for a 5-ton electric crane with a 40-foot span. Fox Bros. & Co., 126 LaFayette street, New York city, are inquiring for a 25-ton electric crane for shipment to Catasauqua, Pa. The United States, Cuban & Allied Engineering Co., 50 Broad street, New York city, is in the market for a 15-ton electric crane.

The Thompson-Starrett, New York city, has awarded 87 hoists to J. N. Kinney, contracting engineer, 30 Church, New York city, for the government explosive plant at Nitro, W. Va.

Many Inquiries Received At Cleveland

A FLURRY of inquiries, especially for the larger sizes of lathes, characterized the market situation in the Cleveland district. Practically all the leading dealers and supply houses reported that they were swamped with inquiries for machines and tools, with emphasizes on the fact that they were for government work. The demand for equipment to supply the government's needs was so great as to exclude other industries from the field. One dealer who recently returned from a scouting trip throughout the district estimated that production was six months in arears of the demand and that the situation could be expected to become more serious. Dealers are hopeful that the government will step in and make some provision for supplying the manufacturers with the necessary skilled labor, the lack of which is said to be one of the primary reasons for there not being more production.

One dealer had received in one day inquiries for $250,000 worth of machinery, all for government work, and had to turn most of them down.

A great many inquiries were received from manufacturers of tractors as a consequence of the government's special efforts along this line. The International Steel Tie Co., Collinwood, O., was reported in the market for machines and tools, having arranged to double the capacity of its plant to make parts for the Ohio Trailer Co., Nottingham, O., which is making a special type of trailer on which "baby" tractors will be conveyed to their special fields of operation. The Craftsman Tool Co., Connaught, O., is in the market for a 24-inch by 24-inch by 6 foot planer. The White Co., Cleveland, is seeking large quantity of machine tools. The Advance Machinery Co., Van Wert, O., is looking for a cylindrical grinder while the Canadian Fairbanks, Morse Co., Toronto, has been making inquiries in the Cleveland district for a No. 1 key seater. The Timken Roller Bearing Co., which recently came into the market for a large number of Browne & Sharpe grinders, is reported to have obtained them, being more fortunate in this respect than most manufacturers.

The Standard Parts Co., and the American Shipbuilding Co., are reported to be in the market for big lathes and other machines.

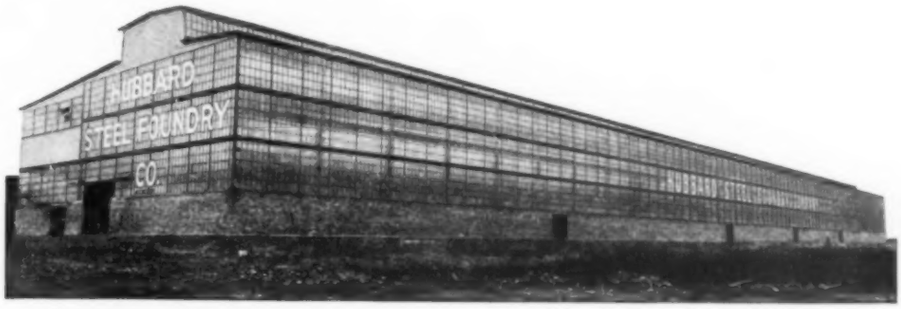
Chicago Buying Limited to War Needs

BUYING of machine tools in the Chicago district is confined almost entirely to war needs, practically nothing moving to users not engaged in some line of war preparation. Some dealers find the month opening comparatively dull, while others have been closing business of considerable extent. As a rule, however, buying is in small lots and from miscellaneous branches of industry, as war manufacture has brought a need in almost every line for a better balance of equipment or additions to meet new demands.

Railroads are evincing a disposition to buy somewhat more freely, though no large business is coming out from this source. The Rock Island railroad has placed a few tools on its recent inquiry and the Monon and St. Paul railroads are about ready to take some further equipment. The Symington-Chicago Corp., which is establishing a large plant in Chicago for making shells, is in the market to some extent. Its heavy buying in the east for this plant seems to have been unsatisfactory as to delivery in some cases and changes are said to be in the making to correct this.

The R. M. Eddy Foundry Co., Chicago, which recently bought a site for a plant, is equipping for the manufacture of machine tools to expedite munition manufacture, including band turning machines, groovers and end facing lathes suited to 155 millimeter shells. It is buying general machine-shop equipment. The Vierling Steel Works, Chicago, has bought adjoining real estate on which to build an extension of its plant. The Universal Machinery Co., Milwaukee, will build a power plant at its West Allis plant. The Semet Solvay Co. is planning a picric acid plant at Grand Rapids, Mich. The Central Forge Co., Detroit, is building an extensive drop forge plant. The

SPEEDING with ROLLING MILL JIM



Say Fellows! you remember the first of March I told you the "Hubbard" broke ground for a new foundry? Well here's a picture of her, she started with a BANG, June 3rd. Just 93 days! She has ***some*** up-to-date equipment in her, installed by ***some speed artists,*** I'll say: electric furnace, open hearth furnace and all that swell stuff. Pike her off for yourself!

So long,

Rolling Mill Jim.

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.

A. Gilbert & Sons Brass Foundry Co., St. Louis, is building additions to its foundry and machine shop. The Vulcan Mfg. Co., Seattle, Wash., is adding to its foundry and machine shop and erecting a craneway.

War Work Takes Lead In Pittsburgh

THE machinery and machine tool market in the Pittsburgh district presents little in the way of new features. Outside of the government requirements, inquiries are few, for builders can guarantee prompt delivery only on lines in stock and these are not at all large or extensive. There are wants to be filled, but buyers realize the futility of trying to secure machines and tools in competition with the government, especially in view of the fact that 90 days is about the quickest delivery that is offered even on small tools.

Lists have been issued covering the probable requirements of the Neville island gun plant and every machinery and tool concern in this district is working over these lists. The lists are of a blanket character and cover every line that possibly may be used in the plant. Actual plans of the Neville works have not yet been worked out and consequently specific lists of requirements are not available. It is known that the government now proposes to spend over $100,000,000 in the construction of the Neville island plant, as compared with the original estimate of $40,000,000 and machine and tool requirements will be proportionately larger than originally planned. It would seem as though the lists would soon be worked out for active preparations are under way for the construction of the plant, a move in this direction being a mobilization of 20,000 laborers under the direction of the United States employment service.

Demand for rolling mill equipments is reported as slow. There is almost no inquiry from the larger concerns, but the smaller companies are fairly good buyers. The Pittsburgh Reinforced Brazing & Machine Co., Pittsburgh, has had plans made for adding a story to its present plant, thus double its present floor space and will need equipment. LaBelle Iron Works, Steubenville, O., is negotiating for 400 acres near its holdings on the West Virginia side of the Ohio river and will probably start new construction that will call for equipment. The Mesta Machine Co., Pittsburgh, has received an order approximating $2,000,000 for piercing presses, draw benches and accumulators for the Neville island ordnance plant.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

PORTLAND, ME.—The Maine Metals Co. has been incorporated to do a general mining business with $200,000 capital by John P. Deering, Albert S. Woodman, Saco, Me., and L. S. Buckingham.

WATERVILLE, ME.—Bids are being received by the Maine Central railroad for the construction of a 2-story, 60 x 140-foot pattern shop. B. T. Wheeler, Portland, Me., chief engineer, is in charge.

AMESBURY, MASS.—The Murphy Aluminum & Bronze Foundry has been incorporated with $10,000 capital by Norman Russell, William J. Murphy and William H. Clark.

BOSTON.—The Blue Flame Safety Heating Co. has been incorporated with $50,000 capital by P. L. McBride, John H. Johnson, Wollaston, Mass.; and O. B. Johnson.

BROOKLINE, MASS.—E. S. Ritchie & Sons have let the contract for a brick, 1-story, 29 x 37-foot addition.

ENFIELD, MASS.—The Grant S. Kelley Woolen Co. has let the contract for a 1-story, 20 x 45-foot addition.

FLORENCE, MASS.—The foundry of W. W. Murphy was damaged by fire, July 27, with $3000 loss.

LAWRENCE, MASS.—The American Woolen Co. will build an 8-story mill adjoining its present plant.

MEDFORD, MASS.—The Medford Woolen Mfg. Co. will build a 1-story, 60 x 150-foot storehouse.

MILFORD, MASS. — The Milford Iron Foundry has let the contract for an 88 x 97-foot addition.

NATICK, MASS. — The Northway Motors Corp. has awarded the general contract for the construction of a 1-story, 200 x 600-foot automobile plant.

SOMERVILLE, MASS.—The New England Bakery has let the contract for a 2-story, 98 x 163-foot building to cost $100,000.

SOUTH BOSTON, MASS.—The Walworth Mfg. Co. has let the contract for a brick, 1½-story, 30 x 40-foot addition to its factory.

SOUTH BOSTON, MASS. — The Lowe Bros. Co. is building a 3-story, 80 x 90-foot storehouse.

SOUTH BOSTON, MASS. — The Daniel Russell Boiler Works is building a steel and reinforced concrete, 1-story, 37 x 71-foot garage and stock building.

SPRINGFIELD, MASS.—The Victory Motor Corp. has been incorporated with $10,000 capital by Patrick J. Kennedy Jr., Edward P. Bagg Jr., Holyoke, Mass., and Henry Lasker.

WORCESTER, MASS.—The Massachusetts Contracting Co. has been incorporated with $25,000 capital by Orlando W. Norcross, Albert J. Park and A. A. Vaughan.

PROVIDENCE, R. I.—The Draft Regulator Co. has been incorporated with $25,000 capital by Whiting Metcalf, George F. McCanna and George J. Sheehan, Cranston, R. I.

WOONSOCKET, R. I. — The Enterprise Dye Works has let the contract for a 2-story, 72 x 88-foot addition.

WOONSOCKET, R. I. — The Alsace Worsted Co. has let the contract for a 3-story, 40 x 280-foot addition to cost $45,000.

BRIDGEPORT, CONN. — The Susman Feuer Co. has let the contract for a 4-story, 53 x 75-foot warehouse.

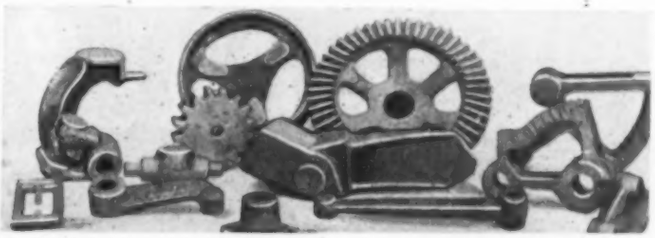
HARTFORD, CONN.—The Henry Souther Engineering Co. will build a brick, mill construction, 2-story, 30 x 35-foot extension and a 1-story, 35 x 40-foot addition.

HARTFORD, CONN.—The Colt's Patent Fire Arms Mfg. Co. has awarded the contract for the construction of two factory buildings, one to be one story, 35 x 80 feet and the other two stories, 40 x 80 feet.

HARTFORD, CONN.—The Spencer Turbine Co. has awarded the contract to R. G. Bent & Co. for the construction of two factory buildings. One structure will be one-story, 77 x 300 feet, and the other, two stories, 40 x 77 feet.

NORWALK, CONN. — The Central Trust Co. will build a brick and limestone, 1-story, 46 x 72-foot building to cost $50,000.

PLAINVILLE, CONN. — The Westwood Mfg. Co. has been incorporated with $50,000 capital by Fred C. Prelle, Jason M. Barrett, both of New Haven, Conn., and Horace K. Lovell.

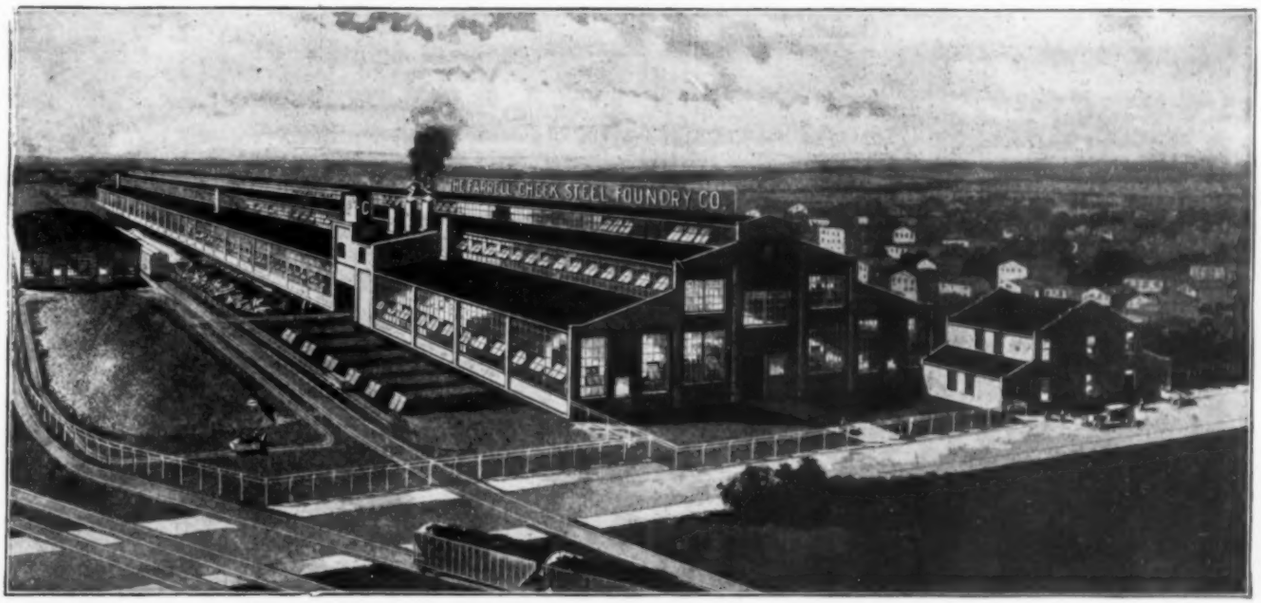


"Boy! Page Mr. Manufacturer, at once"

We have a proposition for him to decide. It matters not whether he is a manufacturer of automobiles, trucks or tractors, or whether he manufactures lathes, gears or machine tools. So long as he uses small castings in his product he must decide whether it pays him to use cheap and unservicable castings, or the *"Farrell-Cheek"* kind. It's the difference between getting service out of what you buy or everlastingly having trouble with your product. Send us your specifications or blueprints and let us make "quality quotations on quantity orders".

Farrell-Cheek Steel Foundry Co.

SANDUSKY, OHIO



Along the Middle Atlantic Seaboard

BINGHAMTON, N. Y.—Property has been purchased near here, by the Binghamton Bridge Co. for the erection of a hydro-electric plant.

BROOKLYN, N. Y.—A $20,000 factory building, 96 x 150 feet, will be erected by the Modern Toy Co.

BUFFALO.—The Barcalo Mfg. Co. is to build an addition, calling for an outlay of $8000.

BUFFALO.—Cousin & Sons Boiler Works has had plans prepared for a 1-story boiler shop, 85 x 120 feet.

BUFFALO.—Bids now are being received by the National Lamp Works of the General Electric Co. on a $180,000 power house and factory building.

CORTLAND, N. Y.—The Rockaway Motor Co. will build a 1-story, 50 x 200-foot plant addition.

GENEVA, N. Y. — The Cathapole Boiler Works will erect a small addition to its foundry.

GENEVA, N. Y.—A $100,000 distribution plant is being contemplated in this city by the Standard Oil Co.

LONG ISLAND CITY, L. I., N. Y.—Bids now are being received by Architect Dwight Seabury, Pawtucket, R. I., on a $60,000 silk mill for Aaron Cohen, 212 Fifth avenue, New York. The structure will be 73 x 212 feet.

MASPETH, L. I., N. Y.—Architect H. J. Krapp, 114 East Sixteenth street, New York, is drawing plans for two warehouses.

PHOENIX, N. Y.—Plans have been completed for a 3-story, 50 x 200-foot silk mill for John Dunlop's Sons.

ALLENTOWN, PA.—The Bethlehem Motors Corp. has let the contract for a warehouse, 80 x 200 feet, to cost $30,000.

BRADFORD, PA.—The Pittsburgh Bridge & Iron Works, Rochester, Pa., is erecting a foundry, 86 x 206 feet, for the Bovard & Seyfang Co.

CHARLEROI, PA.—Alexander A. Garroway has bought 29 acres near West Elizabeth, Pa., as a site for a manufacturing plant.

GROVE CITY, PA.—The Bessemer Motor Truck Co. let the contract for a plant, 90 x 442 feet, at Holmesburg Junction, Pa., to the Crowell-Lundorf-Little Co., Philadelphia.

HAZELTON, PA.—The Washington Pump & Machinery Corp. is taking bids for an addition, one story, 100 x 200 feet.

HILLSVILLE, PA. — The Carbon Limestone Co. is planning an addition to its plant.

MILTON, PA.—The Milton Mfg. Co. is planning to rebuild its forge shop.

PHILADELPHIA.—The Atlantic Refining Co. has finished plans for a $350,000 addition.

PHILADELPHIA. — The Richard De Cou Co. contemplates the erection of a 1-story foundry.

PHILADELPHIA. — William & Harvey Rowland, Inc., will receive bids shortly on a 1-story, 100 x 175-foot factory building to replace the structure recently damaged by fire.

PHILADELPHIA. — The general contract for a $30,000 addition to plant of the Keystone Supply & Mfg. Co. has been awarded to Smith, Hardican & Co.

PITTSBURGH, PA. — The Pennsylvania Chocolate Co. is planning to build a $95,000 plant.

PITTSBURGH.—The Garland Steel Products Co. with a capital of $5000, has been incorporated by L. R. Martin, E. C. McHugh, F. J. Young, J. F. Soles and R. T. Rossell.

PITTSBURGH.—The Fuller Coal & Coke Co. has been incorporated with a capital of $5000 by L. R. Martin, R. T. Rossell and E. C. McHugh.

PITTSBURGH.—The Baltimore & Ohio railroad has had plans prepared by Chief Engineer H. A. Lane, Baltimore, for a four-story locomotive repair shop and freight house, to cost $400,000.

SHAMOKIN, PA.—The Kones Coal Co. will build an addition.

WHEATLAND, PA.—The Pennsylvania Co. will start construction soon on a new roundhouse, car shops and tipple.

KEARNEY, N. J.—The contract for the construction of an assembling plant for the Ford Motor Car Co. has been awarded to the George A. Fuller Co., 175 Fifth avenue, New York City.

ANNAPOLIS, MD.—The navy department is having plans prepared for an electrical power plant here, to cost $300,000.

BALTIMORE, MD.—The Virginia-Carolina Navigation Co. will build a freight shed.

BALTIMORE, MD.—Morrow Bros. have the contract for a forge shop for the Bartlett-Hayward Co.

BALTIMORE, MD.—J. T. Louis & Brothers Co. has let the contract for the construction of a $2,500,000 plant to the McIver Construction Co.

EDGEWOOD, MD.—The Austin Co. has the contract for a plant for the ordnance department, to consist of 10 buildings, 100 x 200 feet, which will cost $5,000,000.

SPARROWS POINT, MD.—The Maryland Steel Co. has let the contract for the building of three 600-foot shipways to the Abertaw Construction Co.

Activities in the Central States

APPLETON, WIS.—The Reliance Motor Truck Co. will build a 3-story plant, 45 x 250 feet, costing $50,000.

BARTON, WIS.—Johnson & Drake, Minneapolis, have the contract to construct a power dam, 11 x 140 feet, for W. F. Gadow.

KENOSHA, WIS. — The business of the Northwestern Iron & Metal Co. has been purchased by L. Goldman, Chicago, who will enlarge the plant.

MANITOWOC, WIS.—The board of public works has been authorized to call for bids for the erection of structural steel gates at the Eighth and Tenth street bridges over the Manitowoc river.

MILWAUKEE.—The Bayley Mfg. Co. will build an addition to its foundry.

MILWAUKEE.—The Overy Mfg. Co. will have a testing plant, 63 x 200 feet.

MILWAUKEE.—The Wisconsin Gun Co. has awarded the contract for a plant addition, 130 x 300 feet, to cost $150,000 with equipment.

MILWAUKEE. — The new scrap metal warehouse and shipping depot of Jos. Benesch & Co., completed recently, is being enlarged by a 1-story addition, 40 x 65 feet.

MILWAUKEE.—C. A. Kleppe is the lowest bidder for the construction of building, tanks, flumes, etc., for the proposed experimental water purification plant to be built on Jones island.

MILWAUKEE, WIS.—Articles of incorporation have been filed by the Rockfield Products Co., to engage in mining, smelting, quarrying, etc. The capital stock is $400,000 and the incorporators include Arthur G. and Philip W. Kraemer.

RACINE, WIS.—A company is being formed by Christ C. Mortensen to build a plant and manufacture a lock nut.

SHEBOYGAN FALLS, WIS.—The Falls Motors Corp. is preparing to erect an addition, 60 x 135 feet.

SHEBOYGAN, WIS. — The Jenkins Machine Co. has awarded contracts for a shop addition costing $12,000.

DETROIT. — The Central Forge Co. is building a drop forge plant costing $350,000.

DETROIT.—The Wisconsin Bridge & Iron Co. will build a plant costing $70,000.

DETROIT.—The Detroit Twist Drill Co. will build a 3-story addition, 35 x 71 feet.

DETROIT.—The Chicago Pneumatic Tool Co. will build an addition, 50 x 70 feet. W. R. Sellif is secretary.

DETROIT. — The General Aluminum & Brass Casting Co. is building a 1-story plant, 35 x 101 feet, to cost $25,000.

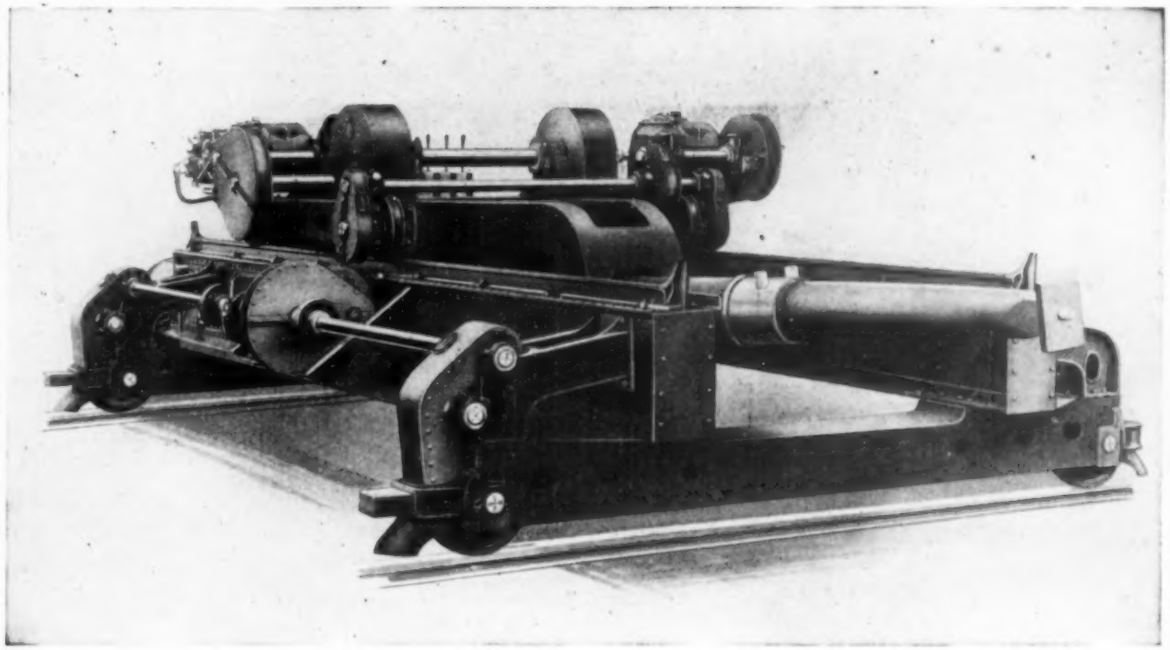
DETROIT. — The American Blower Co., manufacturer of fans and exhaust machinery, is building a 1-story addition, 51 x 176 feet. J. T. G. Miller is general manager.

DETROIT.—The Hoskins Mfg. Co., Lawton avenue, manufacturer of pyrometers and wire products, will build a 1-story foundry, 60 x 100 feet.

GRAND RAPIDS, MICH. — The Semet-

W S M

STEEL PLANT EQUIPMENT
COKE OVEN MACHINERY
GAS PRODUCERS
ORE AND COAL HANDLING MACHINERY
SPECIAL CRANES
MINING MACHINERY
HYDRAULIC TURBINES



Charging Machines

The Wellman-Seaver-Morgan Company originated, first built, developed, and for many years was the sole constructor of mechanical chargers for open hearth furnaces.

The W-S-M Low Type Charger is pictured above. Some conditions indicate the use of the High Type Charger or the Crane Type.

We are prepared to build a special machine for your particular requirements.

Bulletin A 7, "W-S-M Charging Machines and Manipulators," will be sent on request.

THE WELLMAN-SEAVER-MORGAN CO.

CLEVELAND, OHIO, U.S.A.

Solvay Co. will receive bids soon for the construction of a picric acid plant to cost $2,000,000.

MOUNT PLEASANT, MICH.—The Transport Truck Co., capitalized at $1,000,000, has been chartered to manufacture trucks, by Milton A. Holmes, H. E. Chatterton, A. E. Gorham, David Warner and E. J. McCall.

VERONA, MICH.—The Plymouth Mining Co. has awarded contracts for the construction of a brick and steel manufacturing building, 1-story, 60 x 177 feet, and 60 x 125 feet.

CHICAGO. — The Eastern Steel Car & Foundry Co. will build a brick and steel addition to cost $30,000.

CHICAGO.—The Acme Steel Goods Co., 2834 Archer avenue, will build a hoop mill at Riverdale. J. E. Mac Murray is president.

CHICAGO.—The Curtis Tractor & Truck Co., capitalized at $2500, has been chartered by Ernest L. Duck, Louis H. Mintz and Henry A. Brandt.

CHICAGO.—Libby, McNeil & Libby, Union Stock Yards, Chicago, will build an 8-story plant, 62 x 150 feet, at Blue Island, Ill., for the manufacture of tin cans.

CHICAGO.—The Duncan Mfg. Co., capitalized at $300,000, has been chartered to manufacture boilers and stoves, by T. B. Eaton and W. G. Rice, of Chicago, and J. W. Hatch, Rockford, Ill.

CHICAGO. — The Amalgamated Machinery Corp. is having plans prepared by William H. Warner, 104 South Michigan avenue, for a 500-foot reinforced planer, assembling building and other improvements.

CHICAGO. — The Northwest Side Iron Works, 1518 North Western avenue, capitalized at $8000, has been chartered by Borah Waintroob, Leo Rosenberg and Anna Waintroob.

EAST ST. LOUIS, ILL.—The American Steel Foundries is building a 2-story addition to its pattern shop at a cost of $10,000.

MONMOUTH, ILL.—The Monmouth Plow Co. is planning to erect a 5-story building 60 x 90 feet and a power plant costing $40,000.

NORTH CHICAGO, ILL. — The Chicago Hardware & Foundry Co. is erecting a 2-story building, 40 x 200 feet, to cost $25,000.

BOONVILLE, IND.—The Graham Valve Co. will build a 1-story foundry, machine shop and core room.

GARY, IND.—The Gary Motor Truck Co. will take bids soon on a 2-story factory addition 75 x 135 feet, to cost $25,000.

INDIANAPOLIS, IND.—The Oakes Mfg. Co., Wheeler and Roosevelt streets, will build a 1-story addition.

KOKOMO, IND.—The Haynes Stellite Co. is building a machine shop and foundry, 60 x 132 feet, to cost $30,000.

MT. VERNON, IND. — The Hironimus Tractor Co., recently chartered with capitalization of $50,000, will establish a plant at Mt. Vernon. F. W. Hironimus is manager.

MUNCIE, IND.—A new building to occupy two blocks, and which will double the capacity of the plant is to be erected for the Warner Gear Co.

SOUTH BEND, IND. — The Studebaker Corp. will build a 1-story forge shop, 162 x 306 feet, and a machine shop, 200 x 576 feet.

BUCYRUS, O.—The Bucyrus Machine & Tool Co. recently was incorporated with $50,000 capital by P. Browersky, J. D. Neikirk, Harry Browersky and others.

CANTON, O.—H. A. Roemer, general superintendent of the Canton Sheet Steel Co., recently stated that additions are to be erected as soon as a bond issue of $3,500,000 by the Hydraulic Pressed Steel Co., Cleveland, is floated.

CLEVELAND.—The Austin Co. has the contract for the construction of a factory building, 60 x 216 feet, for the Cleveland Automatic Machine Co.

CLEVELAND. — The Chicago Pneumatic Tool Co. recently awarded the George A. Fuller Co., Chicago, a general contract for a factory addition, 80 x 293 feet, to cost $100,000.

CLEVELAND.—Arrangements for the taking over of the Ben Hur plant at Willoughby recently were completed by John D. Fackler, attorney, Williamson building. The plant, which has been in the hands of a receiver for some time, will be converted into a war plant.

COLUMBUS, O. — Frank Packard, New Hayden building, is taking bids for an engine house and stock yards for the Pennsylvania railroad.

COLUMBUS, O.—Preliminary steps are to be taken soon toward the erection of an addition to the government military depot near here.

DAYTON, O.—The Dayton Adding Machine & Time Lock Co. is contemplating the erection of an extension to its plant. The company recently increased its capital.

LONDON, O.—G. J. Nord, of the London Fabric Mills Co. is completing plans for the erection of a factory here.

SALEM, O.—A bridge of reinforced concrete structure, is to be built near here. It will cost $14,000.

New Business in Eastern Canada

BEAVER COVE, B. C.—The Beaver Cove Lumber & Pulp Co. has commenced the erection of lumber and pulp mills. The company also has completed surveys for a water-power plant to cost about $60,000.

CAMPBELL RIVER, B. C. — The mill, lumber camp, etc., owned by the International Timber Co., Seattle, Wash., was damaged by fire with a loss of $70,000.

PORT COQUITLAM, B. C.—A. W. Keith is having plans prepared for the erection of a woodworking plant, to cost about $50,000.

RICHMOND, B. C.—The municipal council of Stevenson proposes to install an electric lighting plant and system, to cost $50,000.

SQUAMISH, B. C. — The department of railways, provincial government, will construct a hydro-electric plant at Squamish to cost about $250,000.

VANCOUVER, B. C.—The Robertson Iron Works is having plans prepared for the erection of an engineering plant to cost $100,000.

VICTORIA, B. C. — The department of railways, dominion government, Ottawa, Ont., has secured a site and will commence work at once on railway terminals here.

BRAMPTON, ONT.—Bids are being received by the town council for the reconstruction of the sewage disposal plant to cost $25,000.

BRANTFORD, ONT.—Motor Trucks, Ltd., is building a plant to cost upward of $100,000.

ELORA, ONT.—The T. E. Bissell Co. is in the market for a Beaudry upright trip hammer, belt driven.

GUELPH, ONT.—The city water commission will install an auxiliary pumping unit in the waterworks plant, to cost $16,000.

LONDON, ONT. — The Dennis Wire & Iron Works Co., Ltd., is in the market for sheet metal squaring shears, power drive, to cut up to ⅛-inch metal, 8 to 10 feet long; also sheet metal brake, 10 feet modern design.

NORTH BAY, ONT.—Bids will be called shortly for the erection of a pumping station to cost $10,000.

ORANGEVILLE, ONT.—The Dods Knitting Co. will build an addition and install new machinery to cost $40,000.

SARNIA, ONT. — The Anker-Holth Mfg. Co., Ltd., has been incorporated to manufacture farm implements, machinery, tools, etc., with $40,000 capital by Frederick F. Pardee, Norman S. Gurd, Frederick R. Reeves and others, of Sarnia.

SAULT STE. MARIE, ONT.—Construction work will be started at once on the erection of a pumping plant for the town council.

ST. THOMAS, ONT.—The Elgin Mfg. Co. will install an up-to-date steam power plant.

TORONTO, ONT.—The Corrugated Paper Box Co., Ltd., will build an addition to cost $6000.

TORONTO, ONT.—The A. R. Williams Co. has purchased the property of the Dominion Bronze Co. at Preston, Ont.

TORONTO, ONT.—The British Forgings, Ltd., will erect a heat treating plant to cost $12,000.

WINDSOR, ONT. — The Menard-McKeon Truck Co., Ltd., has been incorporated to manufacture motor trucks, machinery, etc., with $1,000,000 capital by Moses Menard, Frederick H. Neal, both of Windsor, Ont.; Denis C. McKeon, of Hamilton, Ont., and others.

WINDSOR, ONT. — The Ideal Fence & Spring Co. of Canada, Ltd., has been incorporated to manufacture wire, etc., with $300,000 capital by Gordon M. McGregor, Windsor, Ont.; William A. Leith, of Walkerville, Ont.; Frank W. Prentice, of Adrian, Mich., and others.

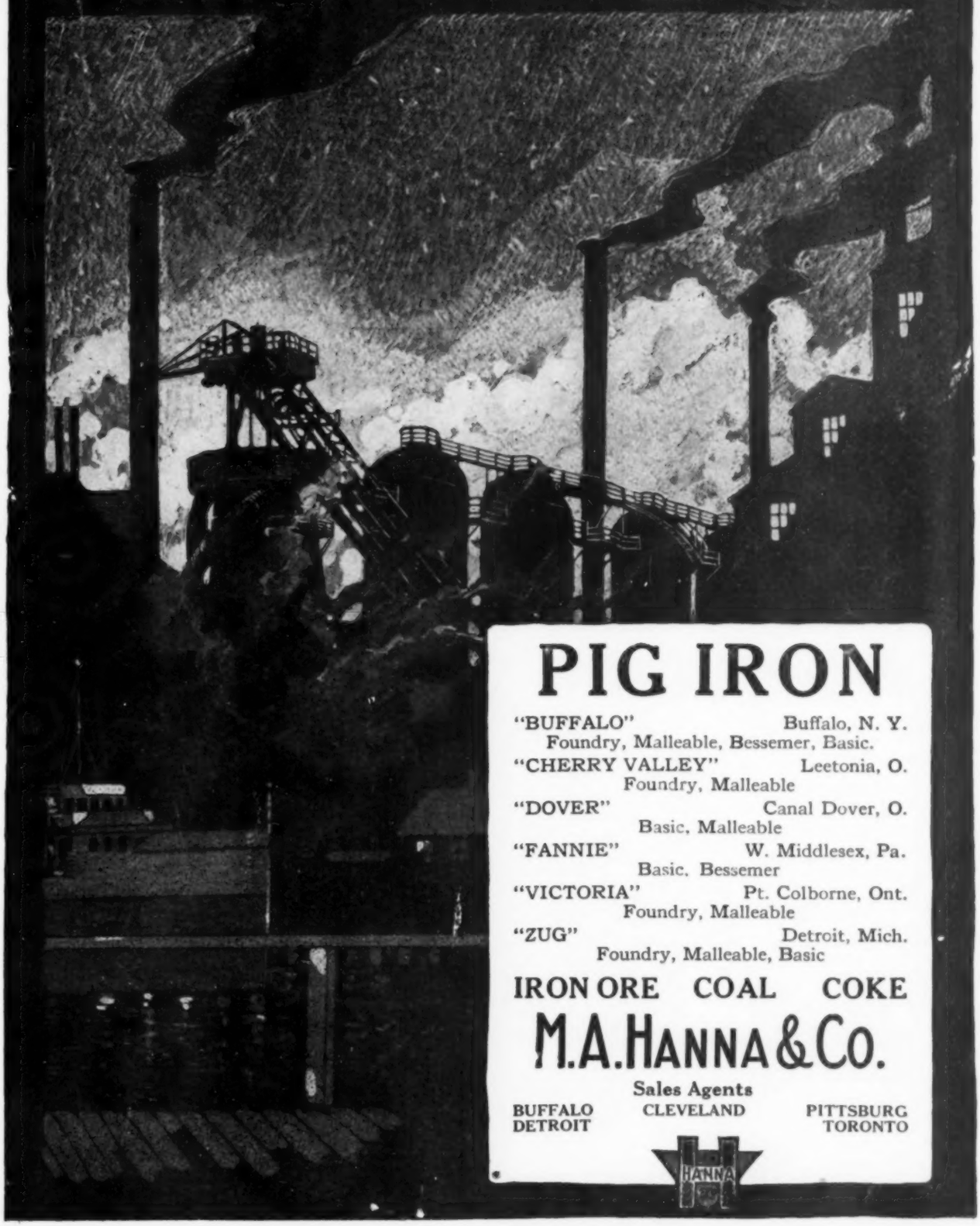
DRUMMONDVILLE, QUE. — The Drummondville Match Co. has let the contract to J. A. Nadeau for the erection of a match factory to cost $100,000.

LAUZON, QUE. — The town council is having plans prepared for the construction of a waterworks plant and system to cost $10,000.

MONTREAL, QUE.—The Canadian Rolling Mills Co. will build an addition to cost $40,000.

MONTREAL, QUE.—The Dominion Refractories, Ltd., has been incorporated to manufacture metals, etc., with $250,000 capital by Leon Daoust, Aime Daoust, Annie McPartlin and others, of Montreal.

HANNA



PIG IRON

"BUFFALO" Buffalo, N. Y.
Foundry, Malleable, Bessemer, Basic.

"CHERRY VALLEY" Leetonia, O.
Foundry, Malleable

"DOVER" Canal Dover, O.
Basic, Malleable

"FANNIE" W. Middlesex, Pa.
Basic, Bessemer

"VICTORIA" Pt. Colborne, Ont.
Foundry, Malleable

"ZUG" Detroit, Mich.
Foundry, Malleable, Basic

IRON ORE COAL COKE

M. A. HANNA & Co.

Sales Agents

BUFFALO CLEVELAND PITTSBURG
DETROIT TORONTO

HANNA

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports	
Old range Bessemer, 55 iron	$6.40
Mesabi Bessemer, 55 iron	6.15
Old range non-Bess., 51½ iron	5.65
Mesabi non-Bess., 51½ iron	5.50

WAREHOUSE PRICES

Steel bars, Chicago	4.17c
Steel bars, Cleveland	4.07c
Steel bars, Detroit	4.13c
Steel bars, Philadelphia	4.13c
Steel bars, New York	4.145c
Steel bars, St. Louis	4.24c
Steel bars, Cincinnati	4.13c
Steel bars, St. Paul	4.395c
Steel bars, Buffalo	4.10c
Iron bars, Buffalo	4.70c
Iron bars, Chicago	4.10c
Iron bars, Cleveland	4.67c
Iron bars, Detroit	4.75c
Iron bars, St. Louis	4.24c
Iron bars, Cincinnati	4.13c
Iron bars, Philadelphia	4.60c to 4.73c
Iron bars, New York	4.745c
Shapes, Chicago	4.27c
Shapes, Detroit	4.23c
Shapes, St. Louis	4.34c
Shapes, St. Paul	4.495c
Shapes, New York	4.245c
Shapes, Cleveland	4.17c
Shapes, Philadelphia	4.23c
Shapes, Buffalo	4.20c
Shapes, Cincinnati	4.23c
Plates, Buffalo	4.45c
Plates, Chicago	4.52c
Plates, Detroit	4.48c
Plates, St. Louis	4.59c
Plates, St. Paul	4.745c
Plates, New York	4.495c
Plates, Cleveland	4.42c
Plates, Philadelphia	4.48c
Plates, Cincinnati	4.48c
No. 10 blue anl. sheets, Chi.	5.52c
No. 10 blue anl. sheets, Cleve.	5.42c
No. 10 blue anl., Buffalo	5.45c
No. 10 blue anl., sheets, St. L.	5.59c
No. 10 blue anl. sheets, Cinci.	5.48c
No. 10 blue anl. sheets, St. Paul	5.745c
No. 10 blue anl. sh., Detroit	5.48c
No. 28 black sheets, Chgo.	6.27c
No. 28 black sheets, Cleve.	6.42c
No. 28 black sheets, Cinci.	6.48c
No. 28 black, Detroit	6.48c
No. 28 black sheets, St. L.	6.59c
No. 28 black sheets, St. Paul	6.745c
No. 28 galv. sheets, Chgo.	7.52c
No. 28 galv. sheets, Cleve.	7.67c
No. 28 galv. sheets, Cinci.	7.73c
No. 28 galvanized, Detroit	7.73c
No. 28 galv. sheets, St. L.	7.59c
No. 28 galv. sheets, Buffalo	7.70c
Hoops, Cleveland	4.92c
Hoops, Detroit	4.98c
Hoops, Buffalo	4.95c
Cold rolled sheets, Buffalo	6.45c
Cold rolled steel	list and 10

IRON AND STEEL SCRAP

(Prices in Gross Tons)

STEEL WORKS USE

Bundled sheets, Cincinnati	$23.00 to 23.50
Bundled sheets, Pittsburgh	22.00
Bundled sheets, Cleveland	24.50 to 25.50
Bundled sheets, Buffalo	24.00 to 25.00
Boiler plate, cut, No. 1, Chg.	27.50 to 28.50
Boiler plate, cut No. 1, St. L.	25.50 to 26.00
Frogs, switches, guards, St. L.	28.50 to 29.00
Frogs, switches, guards, Chgo.	29.00
Heavy melting steel, Pitts.	29.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chgo.	29.00
Heavy melt'g steel, Cleveland	29.00
Heavy melting steel, Cinci.	28.00 to 28.50
Heavy melt'g steel, east. Pa.	28.00 to 29.00
Heavy melting steel, N. Y.	26.00
Heavy melting steel, St. L.	28.00 to 28.50
Heavy melt'g steel, Birming.	26.00 to 26.50
Baled sheets, Cleveland	28.50 to 29.00
Baled sheets, Pitts.	26.00
Baled sheets, Chgo.	27.75 to 28.25
Knuckles, couplers, Chgo.	34.00
Knuckles, coup., St. Louis	33.00 to 33.50
Low phos. steel, Buffalo	37.50
Low phos. steel, Pittsburgh	39.00
Low phos. crops eastern Pa.	39.00
Low phos. guaranteed E. Pa.	36.50
Shoveling steel, Chicago	29.00
Shoveling steel, St. Louis	28.50 to 29.00
Springs, Chgo.	34.00
Steel rails, short, Chicago	34.00
Steel rails, short, Cleveland	34.00
Steel rails, short, St. Louis	30.75 to 31.25
Steel rails, old, Birmingham	26.00 to 28.00
Stove plate, Chgo.	27.00 to 27.50
Stove plate, Cincinnati	22.50 to 23.00
Stove plate, St. Louis	26.00 to 27.00
Stove plate, N. J. points	27.50
Stove plate, Birmingham	23.00 to 24.00
Stove plate, Buffalo	27.50 to 28.00
Stove plate, eastern Pa.	26.50
Stove plate, Cleveland	25.00 to 25.50
Stove plate, Pittsburgh	26.50 to 27.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.40
Boston	4.60
Philadelphia	4.10
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.75
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$7.50
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York (r. and w.)	7.50
Philadelphia (r. and w.)	6.60
Pittsburgh	6.10
Savannah, Ga.	3.40
St. Louis	4.25
Chicago to:	
Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.75
Cincinnati	1.75
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70
Duluth, Minn., to:	
Minneapolis, St. Paul	$1.60
Mayville, Wis.:	
Minneapolis-St. Paul	$2.20

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	24.5 cents
Philadelphia	23.0 cents
Boston	27.0 cents
Buffalo	21.5 cents
Baltimore	22.5 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	56.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

IRON MILL USE

Angle bars, iron, Chgo.	39.00
Angle bars, steel, St. Louis	30.75 to 31.25
Angle splice bars, St. Louis (iron)	37.50 to 38.00
Arch bars, transoms, Chgo.	45.50 to 46.50
Arch bars and transoms, St. Louis	44.00 to 44.50
Busheling, No. 1, Cleveland	29.00 to 30.00
Busheling, No. 1, Buffalo	29.00 to 30.00
Busheling, No. 2, Buffalo	21.00 to 23.00
Busheling, No. 1, Pittsburgh	32.00
Busheling, No. 1, Cincinnati	26.00 to 26.50
Busheling, No. 1, Chgo.	30.50 to 31.00
Busheling, No. 2, Chgo.	20.00 to 21.00
Busheling, No. 1, St. Louis	29.00 to 29.50
Cast borings, New York	15.50 to 16.00
Cast borings, eastern Pa.	19.00
Cast borings, Buffalo	18.00 to 19.00
Cast, borings, Cleveland	18.50 to 19.00
Cast borings, Cincinnati	17.00 to 17.50
Cast borings, Pittsburgh	19.00
Cast borings, Birmingham	17.00 to 18.00
Cast borings, Chgo.	18.50 to 19.00
Cast borings, St. Louis	18.00 to 18.50
City wrought, long, N. Y.	30.00
Cut forge, Chgo.	32.00 to 32.50
Forge flashings, small, Cleve.	27.00 to 27.50
Forge flashings, large, Cleve.	27.50 to 28.00
Forge No. 1, eastern Pa.	27.50 to 28.50
Grate bars, Buffalo	27.50 to 28.00
Grate bars, Cleveland	25.50 to 26.00
Grate bars, N. J. points	27.50
Iron axles, Pittsburgh	46.50
Iron axles, Cincinnati	43.50 to 44.00
Iron axles, Cleveland	46.50
Iron axles, Chicago	46.50
Iron axles, eastern Pa.	46.50
Iron axles, St. Louis	46.00 to 46.50
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	39.00
Iron rails, Buffalo	36.00 to 37.00
Iron rails, Cincinnati	34.00 to 35.00
Iron rails, St. Louis	38.00 to 38.50
Iron rails, Cleveland	37.00 to 38.00
Machine turnings, Cincinnati	17.00 to 17.50
Machine turnings, Cleve.	18.50 to 18.75
Machine turnings, Buffalo	17.00 to 17.50
Machine turnings, N. Y.	16.25 to 16.75
Machine turnings, Pitts.	18.00 to 19.00
Machine turnings, east. Pa.	19.00
Machine turnings, Birming.	16.00 to 17.00
Machine turnings, Chicago	17.50 to 18.00
Machine shop turnings, St. L.	18.50 to 19.00
Pipes and flues, Cleveland	28.00 to 29.00
Pipes and flues, Chicago	27.50 to 28.00
Pipes and flues, St. Louis	26.25 to 26.75
R. R. mch. cast, No. 1, Buff.	34.00
R. R. wrgt. No. 1, Buffalo	34.00
R. R. wrgt., No. 1, east Pa.	34.00
Railroad wrgt. No. 1 Cinci.	33.50 to 34.00
Railroad wrgt., No. 1, Cleve.	34.00
R. R. wrought, No. 1, Pitts.	34.00
Railroad wrgt., No. 2, Chgo.	32.00 to 32.50
Railroad wr'ght, No. 1, Chgo.	33.50 to 34.00
R. R. wrgt. No. 1, Birming.	27.00 to 28.00
No. 1 yard wrought East Pa.	33.00
No. 1 busheling wrgt., E. Pa.	31.00
Sheet wrought, Pittsburgh	34.00
Railroad wrgt., No. 1, St. L.	33.00 to 33.50
Railroad wrought, No. 2	32.50 to 33.00
Wrought pipe, Buffalo	27.00 to 28.00
Wrought pipe, eastern Pa.	33.00
Wrought pipe, ungraded, eastern Pa.	29.00

IRON OR STEEL WORKS USE

Axle turnings, Cleveland	$24.00
Axle turnings, Buffalo	24.00
Heavy axle turn'gs, E. Pa.	24.00
Heavy axle turnings, Pitts.	24.00
Shafting, New York	35.50
Shafting, eastern Pa.	39.00
Steel car axles, Pittsburgh	46.50
Steel car axles, Birmingham	30.00 to 32.00
Steel car axles, New York	43.00
Steel car axles, Buffalo	44.00 to 46.00
Steel car axles, Cleveland	44.00
Steel car axles, eastern Pa.	46.50
Steel car axles, Chgo.	46.50
Shafting, St. Louis	38.50 to 39.00
Steel car axles, St. Louis	46.00 to 46.50

IRON FOUNDRY USE

Car wheels, (iron), Pitts.	$29.00
Car wheels, (steel), Pitts.	34.00 to 35.00
Car wheels, eastern Pa.	29.00
Car wheels, Buffalo	29.00
Car wheels, Chicago	29.00
Car wheels, St. Louis	28.50 to 29.00
Car wheels, Birmingham	27.00 to 28.00
Car wheels, Cleveland	30.00
Tram car wheels, Birming.	27.00 to 28.00
Cast, No. 1, Birmingham	27.00 to 28.00
Cast, No. 1, cupola east. Pa.	34.00
Cast No. 1, Cleveland	32.00 to 33.00
Cast, No. 1, Cincinnati	33.00 to 34.00
Cast, 1, heavy, N. Y.	32.25
Cast, 1, machy., N. Y.	32.25 to 32.75
Cast, No. 1, Chicago	33.00 to 33.50
Cast, No. 1, Pittsburgh	32.50 to 33.00
Cast, No. 1, St. Louis	31.50 to 32.00
Malleable, Cincinnati	30.00 to 34.00
Malleable, Cleveland	30.00 to 34.00
Malleable, Buffalo	29.00 to 34.00
Malleable, Pittsburgh	33.00 to 34.00
Malleable, east. Pa.	29.00
Malleable, cupola, East Pa.	33.00
Malleable railroad, Chgo.	33.00 to 34.00
Malleable, agricultural, Chgo.	33.00 to 33.25
Malleable railroad, St. Louis	33.50 to 34.00
Malleable agricultural, St. L.	32.50 to 33.00

MISCELLANEOUS USES

Boiler punchings, Chgo.	36.00 to 36.50
Reroll. rails, 5 ft. & ov., Pitts.	34.00
Reroll. rails, 5 ft. & ov., Chgo.	34.00
Reroll. rails, 5 ft. & ov., E. Pa.	34.00
Reroll. rails, 5 ft. & ov., St. L.	33.50 to 34.00
Reroll. rails, 5 ft. or over, Cleve.	34.00
Rerolling rails, long, Birm.	37.50 to 38.50
Locomotive tires, Chgo.	45.50 to 46.50
Locomotive tires, St. Louis	43.50 to 44.00